EXTENSION CLASSES

THE GEORGE BROWN COLLEGE
OF APPLIED ARTS AND TECHNOLOGY
21 NASSAU STREET
TORONTO 2B, ONTARIO
TELEPHONE: 362-3971, LOCAL 126-7-8

E-164

EXTENSION CLASSES

1969-70

The George Brown College of Applied Arts and Technology

21 NASSAU STREET
TORONTO, 2B. ONTARIO

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GENERAL INFORMATION

EVENING CLASSES will be offered in the subjects listed on the following pages from September 29, 1969 to February 27, 1970. The first term begins on Monday, September 29, 1969 and ends December 19, 1969. The second term begins on Monday, January 5, 1970 and ends February 27, 1970, for most courses.
Unless otherwise stated, courses will be offered one evening per week for 20 weeks. Each session is 3 hours in length for a total of 60 hours (instruction and examination). All courses will be conducted between the hours of 7.00 p.m. and 10.00 p.m. Classes are not held on statutory holidays. Extra classes will be started in January of 1970 and April 1970.

REGISTRATION
In person at the George Brown College of Applied Arts and Technology on Monday, September 15, Tuesday, September 16 and Wednesday, September 17 between the hours of 7.30 p.m. and 9.30 p.m. at each of the campuses.

Campus N — 21 Nassau Street	Campus C — 507 College Street
Campus D — 37 Dartnell Avenue	Campus B — 33 Bloor Street East
Campus T — 51 Teraulay Street	

All subjects indicate the Campus that will conduct the course.

FEES
Unless otherwise stated the fee for each course is $26.00 (of 60 hours duration). 30 hour courses are $15.00, 90 hour courses are $40.00, 120 hour courses are $50.00.
This amount includes the $5.00 registration fee and in some cases includes the cost of supplies. Fees must be paid in cash or by money order or certified cheque.
Lab. Fees — In certain courses a minimum lab. fee will be assessed.

IDENTIFICATION
Your receipt is your admit-to-lecture identification and must be shown to the instructor at the beginning of the course and whenever requested. No receipt is an indication of non-registration.

REFUNDS
The Registrar must be notified in writing of a student's withdrawal. Forms are available at the office for this purpose.
Refunds will be made only if requested before the third scheduled lecture. Allowances cannot be made for a change of personal plans or for additional commitments which a student may accept after registering for a course.
In computing the amount of the refund, a charge will be made of $2.00 per scheduled session calculated on a pro-rata basis up to the date of application for a refund regardless of whether or not the student attended classes. The $5.00 registration fee is not refundable.
If a course is cancelled, full refund will be made.
REQUESTS FOR REFUNDS MUST BE ACCOMPANIED BY THE OFFICIAL RECEIPT (white copy).

PARKING
Parking is not available on college property. Some public parking is available at nearby lots.

PREREQUISITES
Candidates should be advised that many of the following courses require considerable related experience. The prerequisites for any given course is a minimum requirement.

MINIMUM ENROLMENTS
The college reserves the right to cancel any class for which attendance has dropped below the required minimum and to suspend or combine during the session any classes in which attendance falls below the minimum. Where classes are suspended a full refund will be issued.
Although it is proposed to adhere to the program as outlined in the calendar, courses and hours of instruction are subject to revision without prior notice.

TEXTBOOKS AND SUPPLIES
Textbooks and supplies for all Extension Courses may be purchased at the George Brown Bookstores: Campus N — third floor of Building number 3, Campus D — Room 106, 175 Kendall Avenue, Campus T — Room 424, 51 Teraulay Street.

SCHOOL CERTIFICATES
Certificates are awarded to all students successfully completing evening courses at the George Brown College of Applied Arts and Technology.
Final grades are based on a combination of term work and the final examination with term work counting for a minimum of 40% of the final mark.
A minimum of 80% attendance is required before certification may be granted in subjects involving practical shop or laboratory work.

SPECIAL COURSES
Special courses will be offered from time to time at the request of individuals or organization if an adequate enrolment is assured.

COUNSELLING
As a community service George Brown College offers general counselling and information at the Bloor Campus, 33 Bloor Street East. Experienced counsellors are on duty each week day from 9.00 a.m. to 8.00 p.m. to advise on educational and other related matters. Appointments are necessary after 4.00 p.m. There is no charge.

ACADEMIC STUDIES

PREREQUISITES — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.

TRADE MATHEMATICS Part 1 — C100 (M1301)

This course is designed for tradesmen, apprentices and persons desiring a course in trade mathematics.
Course Content — whole numbers, fractions and decimals, easy percentages, simple interest, loans, financing, discounts, trade problems in linear measure, area and volume, elementary algebraic process, solution of equations and simple formulae, principle of the slide rule and elementary operations.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

TRADE MATHEMATICS Part 2 — C101 (M13011)

Prerequisite Trade Math, Part 1, or equivalent.
Course Content — Review of arithmetic processes with trade applications, review of algebraic processes, simple equations and transposition of formulae, factors, powers, roots, surds, indices and logarithms, simultaneous and quadratic equations, geometry — simple constructions, deductive, geometry of the circle, trigonometry, solution of angles of any magnitude, sine and cosine rules, solution of any triangle.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INCOME TAX AND THE LAYMAN — C104 (Special)

A course especially designed to help you, the taxpayer, cope with your income tax problems. The course will provide the answers to questions concerning the following:

Who is taxable
What deductions can be claimed
How certain types of income are taxed
Different forms of taxes
Liability for tax
Ontario Succession Duties
How to file your return
Why make out wills
How to obtain relief from taxes

Thursday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D. Fee $26.00.
Course will commence January 12th — Registration January 5, 6 and 7.

GUIDE TO BETTER BUYING — C105 (Special)

This course is designed to help you, the consumer, get the best return for each dollar spent and also, what is often as important, obtain what you need as efficiently as possible.
Course Content — The course consists of ten (10) one hour sessions, during which you will find the answer to such questions as:

What does advertising mean?
How can the best product be distinguished?
How to budget realistically.
How much and how should you borrow?
What are your legal rights as a buyer?

Guest speakers, each a specialist in a particular aspect of business, will answer these questions and many more to help you make the most of your dollar.
This course will be offered during the day at the Teraulay Campus at times arranged for your convenience. Campus T. Fee $26.00.

FUNDAMENTAL LEGAL PERSPECTIVE — C106 (Special)

A non-credit course designed for the layman to enable him to obtain a basic understanding of the Canadian Laws. This is not to be considered an initial law course.
Course Content — The foundation of Canadian law, the court system, the legal problem and how it arrives, Tort Law, Criminal Law, law of property, family law will be covered with particular stress on areas considered of major importance to the people on the course.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

APPLIED PHYSICS (TECHNICAL) — C107 (Physics 133)

Prerequisite — Grade X or equivalent.
Air — Physical and chemical properties, pressure and vacuum, measurement of pressure, the barometer, the manometer, absolute pressure, gauge pressure.
Water — Physical and chemical properties, density and specific gravity, calculation of pressure at a depth, capillarity, P.H. factor.
Heat — Temperature scale, heat transmission, radiation, convection conduction, the B.T.U., latent heat, coefficient of expansion, mechanical equivalent of heat, heat loss and prevention.
Gas laws — Expansion and compression of gases, Boyles law, the vacuum pump, the compression pump.
Hydraulics — Fluids under pressure, action of pressure pumps, action of the venturi, the Water Hammer.
Properties of Materials — Basic metallurgy, ferrous and non-ferrous metals, heat treatment.
Machines — Principles, efficiency, levers, inclined plane, gear drives, belt and chain drives.
Work energy and power — Units of energy and power, horsepower.
Friction — Laws, effects, coefficient of friction.
Strength of Materials — Stress and strain, safety factor, Young's Modulus.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ENGLISH TECHNICAL — C108 (English 130)

This course is intended for the tradesman who wishes to improve his knowledge of the English language. It is related to trade and business English. The work covered will be equivalent to that taken by an apprentice proceeding to journeyman status.

Part I

Parts of Speech — Their function and relation to each other. A study of the errors commonly made with each group.
Use of Words in Sentences — Qualities of good sentences — unity, clarity, correctness and order of words, variety in sentence structure for effective writing.
Expressing Ideas in Paragraphs — Qualities of a good paragraph — unity, coherence and emphasis. Paragraphs on trade topics, trade tools and equipment. Oral and written exercises.

Part II

Analysis and Precis Writing — Passages from trade texts, periodicals, specifications and other sources to be rewritten in precis form.
Short Reports in Essay Form — Descriptive writing of a technical nature on installations, tools and processes. Technical writing — reports on an accident, defective parts and the technical research essay.
Letter Writing — Applications for jobs, requests for material and replies to letters of complaint.
Comprehension and Speed Reading — Practice with Developmental Reading and S.R.A.
Speech — Oral Reading and the preparation and delivery of short speeches.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

CONTEMPORARY READING — C109 (Special)

This course provides the reader with the means to compare, interpret and critically analyze contemporary writing. Selected readings from the works of a variety of modern writers will form the basis for an examination of the relationship between literature and human experience and values.
Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus T. Fee $26.00.

RAPID READING — C110 (Special)

This course is designed to help you improve your rate of reading and also your level of comprehension.
The course is in two sections and is executed in an up-to-date language communication laboratory.
During the first section of the course you will receive a diagnostic analysis of your present reading level. Based on the results of the diagnostic analysis of your present reading level an individualized program will be devised to correct reading difficulties.
In the second section emphasis will be placed on reading improvements to raise your reading speed and level of comprehension.
You will also learn the modern methods of information processing.
Tuesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus T. Fee $26.00.

LABORATORY APPROACH TO READING AND LANGUAGE STUDY — C111 (Special)

This course is designed for those teachers who wish to examine, study and implement the techniques involved in the laboratory approach to teaching reading and language.
The following topics will be discussed:

Philosophy of individualized instruction
The role of instructor in an individualized program
Individual and group activity
Evaluation of equipment and programs

Thursday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus T.

CINEMA AND CULTURE — C112 (Special)

This course is designed to provide a seminar and discussion group for movie goers. The course will help you to evaluate and to interpret current films. Through analysis and comparison you will probe the influence of the movie on culture and society.
Tuesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus T. Fee $26.00.

THE PHILOSOPHY OF THE CITY — C113 (Special)

In this course you will examine the "city" and its relationship to the nature of man. By studying the cities of man, their historical development and present day configuration, such questions as "what sort of city would one create to serve the best interests of man in attaining 'the good life'?" will be examined.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N. Fee $50.00.

BASIC PRINCIPLES OF ADVERTISING, SALES AND MERCHANDISING — C114 (Special)

Prerequisites — Persons involved in or hoping to become involved in this intriguing field. A good knowledge of English is necessary.
Course Content — Can be divided into three parts for detailing topics to be covered as follows:
(a) Advertising — analyzing product; print, radio or TV, direct mail, mail order, liaison with merchandising, copy preparation for print media, radio as a powerful selling force in retail, the use of posters, outdoor media.
(b) Selling — Personnel development; the nature of selling process, factors in the selling process, the customer, product knowledge, the approach, the presentation, the close, the creative factor in all aspects of retail selling.

(c) Marketing — As a process, nature of consumption, customer motivation, tbe overall marketing picture, the retailing structure planning and standardization of products, factors in buying, selection of channels of distribution, price determination and factors in setting prices, sales by marketing function.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus N.

ADVERTISING — C115 (Special)
An orientation course looking at advertising from the marketing, communications and consumer viewpoints. Stress will be placed on:
(1) What advertising is, the position of advertising in our society, the psychology behind advertising.
(2) Advertising as it exists in the framework of both marketing and communications.
(3) A comprehensive study of the various types of media.
(4) Advertising planning and management.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

MARKETING — C116 (Special)
Examination of the principal marketing institutions: agent middleman, wholesalers, retailers, co-operatives, consumer research agencies. Intensive study, using case histories of the more important marketing functions: selecting trade channels, packaging, branding, pricing, personal selling, product planning with special emphasis on the integration of tbese activities.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

SALESMANSHIP — C117 (Special)
Covers the theory and practice of effective selling. This course is designed to familiarize the student with the factors necessary for the development of basic persuasive abilities which are necessary in selling, as *well* as in other fields.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

AUDIO VISUAL THEORY FOR TECHNOLOGICAL AGE — C118 (Special)
Prerequisites — This course reserved for people employed as teachers — primary, secondary, adult, industrial.
Specific details that will be covered are:—
1. INTRODUCTION —
   From Cave drawings to Holograms
2. THE PHYSIOLOGICAL BASIS OF PERCEPTION
   The eye, the ear, and the brain
3. TWO DIMENSIONAL VISUAL PERCEPTION
   The Line, the Shape, and the Area
4. VISIBLE CLUES AND THE THIRD DIMENSION — DEPTH
   Perspective — linear and aerial
   Interposition
   Relative motion
   Intensity gradients and roughness gradients
5. THE INVISIBLE CLUES AND THE FOURTH DIMENSION — TIME
   Lucretius to Einstein
   Memory and the perception of time
   Perception of motion, and apparent time
6. COLOUR THEORY
   Subtractive colour mixtures and the Artist
   Additive colour mixtures and Colour TV
7. INFORMATION THEORY
   The human brain as a receiver
   Psychology and Information Theory
   Art and Information Theory
   The Teacher and Information Theory — What is a good transmitter?
   The Student and Information Theory — What is a good receiver?
   The Transmitter, The Receiver, and the Media between them.

* The course will be divided into approximately 50% theory, 50% practical.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee — $41.00 — including lab fee.

AUDIO VISUAL WORKSHOP — C119 (Special)
Course Content — An intensive course for the acquisition and perfection of skills in the preparation of audio visual materials — 90% practical work.
Thursdays — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee — $41.00 — including lab fee.

SUPERVISION IN INDUSTRY — C120 (Special)
Prerequisite — Employment as foreman or in some other supervisory capacity.
Course Content — The role of the supervisor, leadership, responsibility for personnel, fringe benefits, technical knowledge, planning and scheduling, quality control, cost control, inventory control, methods improvement, wage incentives, job evaluation, industrial organizations, Labour Relations Act, Basic psychology standardized tests.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

POLITICAL SCIENCE (CANADA) — C121 (PS100) (Special)
This course will deal primarily witb political concepts and practices applicable to Canada. Historical background, geographical and political divisions, federalism, legislative processes, provincial government, municipal government, internal policy and accompanying problems, Canada's foreign policies, Canada stressing such situations as residential planning, social problems and federal-provincial relationships.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N. Fee $50.00.

POLITICAL SCIENCE — C122 (PS200) (Special)
Internal and international trade will be stressed. A certain amount of history will be covered leading up to Canada's present position in world markets.
Canada will be covered from early colonial days, trade between the colonies and with the mother country, trade after confederation, reciprocity, pre World War I, the Twenties, the hungry Thirties, the effect of the second World War and post war trade to current trends, including our present monetary setup.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

FORECASTING, PRODUCTION PLANNING & INVENTORY CONTROL — C123
Prerequisite — This course is designed for those who are currently engaged in some planning activity related to manufacturing, warehousing or distribution.
Course Content — Outline in detail of the techniques now used by large and small organizations for — forecasting operating levels, product mix, long and short range production planning, parts and finished goods inventory control.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

EMPLOYMENT AND EMPLOYMENT INTERVIEWING — C124 (Special)
The aim of this course is to enable graduates to successfully interview and evaluate applicants for employment.
Course Content — Personnel department functions, job descriptions, absenteeism, planning for recruitment, on-campus interviews and recruitment, the hiring procedure, types of interview, conduct of interview, aptitude tests, other types of interviewing.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

THEORY AND PRACTICE OF MANAGEMENT — C125 (Special)
Prerequisite — Aspirants for management positions.
The process of managing encompasses a number of management functions such as the planning, organizing and controlling activities. This course is intended to provide students with a background and understanding of the management process as well as an introduction to some of the new concepts and approaches to management problems.
Course Content — The nature of management, the management cycle, planning, organizing and controlling, other management functions, innovating, communicating, motivating and leading, management philosophies, organization structure and behaviour, management performance standards and appraisals, management training and development, management of change.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BASIC PHOTOGRAPHY — C126 (Special)
This course is for amateurs — stress is on the theory of photography. The course includes the study of filters, lenses, films, optics as it pertains to photography and the developing processes.
Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N. Fee $50.00.

T.V. WORKSHOP — C127
A practical seminar for the production of industrial and educational programs for CCTV.
Course Content — The basic TV studio — Lighting for TV — Camera techniques — Switcher-fader operation — VTR operation — Audio-pickup, mix, record — Tele-cine and Program distribution — Production planning and scripting — TV Graphics — Evaluation.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.
Fee — $41.00 — including laboratory fee.

PUBLIC SPEAKING FOR LADIES — C128
The purpose is to promote poise and self-confidence in women who wish to participate more actively in community and public affairs.
Prerequisite — A sound knowledge of English.
Course Content — Who you are and why are you here, relate a humorous story, tell your most embarrasing moment, give a short autobiography, the art of listening, building a speech, platform manners and mannerisms, read a "Letter to the Editor", then state whether or not you agree and wby, introduce a speaker, thank a speaker, give a report, guest lecturer — fashion and grooming, a famous person you admire and why, a famous person you dislike and why, poetry reading, open discussion on current events, debate — party politics on municipal level, final test periods — 5/10 minute speech — members' choice.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee $50.00.

APPLIED ARTS

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

HAND ENGRAVING — 400 (Special)
Prerequisite — Currently employed in the jewellery industry.
Course Content — Engraving in copper of linear and circle ornaments, wriggling and wriggling decorations, closelining and brightcutting, engraving in copper of simple and fancy letters and monograms, engraving in brass and silver, engraving of coats of arms, crests and other designs.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ELECTRIC WATCH SERVICE — 401 (Special)
Prerequisite — Currently employed in watchmaking industry.
Course Content — Introductory electricity, Bulova, Accutron, Hamilton Electric Watches, Swiss Electric Watches, Timex Electric Watches, care in conditioning and handling of electric watches.
Note — This course will consist of 10 evenings.
Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

MEN'S HAIRSTYLING — 402 (Special)
Prerequisite — Applicants must be licensed barbers currently employed in the trade.
Course Content — Practical haircutting, shampoos, discussion on styles, styling and blow waving, tinting, bleaching, processing, razor cutting, hair pieces.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

JEWELLERY DESIGN — 410 (Special)
Prerequisite — Applicants may either be employed in the jewellery industry or interested in jewellery design as a hobby.
Course Content — Development of designs for modern jewellery, rendering of projections in black and white and in colour, rendering of perspective drawings in black and white and in colour .
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

JEWELLERY MAKING — 411 (Special)
Prerequisite — Currently employed in the jewellery industry or hobbyists.
Course Content — Planishing, hard soldering, finishing and polishing of precious metals, elementary jewellery repairs, shaping and forming settings for coloured stones and pearls, transferring designs to metals, cuttlefish casting, centrifugal casting, making models for fast production methods, handmaking of rings, brooches, pendants, earrings and bracelets.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

HOLLOW-WARE WORKSHOP — 412
Prerequisite — Applicants may either be employed in the jewellery industry or interested in hollow-ware as a hobby.
Course Content — Basic principles of hand raising and forming of hollow-ware and flatware, together with proper handling and care of tools and equipment. Projects in sterling silver will be followed by initial work in copper and bronze. Basic soldering, annealing and decorative processes will be dealt with. This course will be largely tutorial in nature but the design and theory sessions will include a history of this kind of work and how it affects contemporary products.
Special evening course workshops will covr only the basic principles as time is not sufficient to give a complete coverage in one session.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

WATCHMAKING — 420 (Special)
Prerequisite — Currently employed in the watchmaking industry.
Course Content — Lathe work, balance work, hairspring work, clock work, watch conditioning, escapement matching, jewelling, making staffs and stems, adjusting, complicated watches, preparation for Canadian Jewellers' Association examinations.
Note — Each section must be successfully completed before further advanced training may be undertaken.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ADVANCED WATCHMAKING — 421 (Special)
Prerequisite — Applicants must be qualified watchmakers willing to study modern advanced theory of watch construction, repair and adjustment. This is a pre-examination course for candidates seeking Ontario certification as a watch repairer.

Course Content — Power supply, gearing, escapement theory, pendulums, balance wheel and hairspring work, hairspring theory, watch cleaning, oiling problems, theory of friction, watch jewelling, watch adjustments.
Note — Lectures will be supplemented by practical bench work wherever possible.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 120 hrs. two night per week. Campus D.

GEMMOLOGY — 425 (Special)
Prerequisite — Applicants may either be employed in the jewellery industry or be interested in jewellery design as a hobby.
This course is offered in close co-operation with the Gemmological Association of Great Britain. The course is taken during two successive winters and upon successful completion of the two examinations the Fellowship of the Association will be granted.
Materials and books $100.00 per session.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

DENTAL TECHNICIAN
Complete Denture Prosthesis — C450
Partial Denture Construction — C451
Orthodontics — C452
Crown and Bridgework — C453
Ceramics and Ceramics to Metal — C454
Applied Science (Dental Materials) — C455
Business Management — C456

These courses are offered to technicians who are at present working in a dental laboratory or for a dentist and cover same work as provided in our DENT 160-day course.
Theory and practical work is offered in these courses of three hour sessions each evening.

Monday	Partial Denture Construction
Tuesday	Complete Denture Prosthesis
Wednesday	Ceramics and Ceramics to Metal
Thursday	Orthodontics
Thursday (Saturday)	Crown and Bridgework
Monday	Applied Science (Dental Materials)
Thursday	Business Management

Every attempt will be made to provide each student with the instruction and experience he most needs on an individual basis.
As above. 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

TEACHING TECHNIQUES — C675 (Special)
This course is designed for people in industry, commerce professions and adult education who have an interest in the instruction of other people. It is a basic course combining a minimum of pedagogical theory with practical instructional technique.
Course Content — Theories of learning — adult learning — individual differences — subject analysis — lesson planning — curriculum development — lesson types — teaching aids — evaluation — practice teaching — critical appraisals of teaching techniques.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ARCHITECTURAL TECHNOLOGY

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.

BRICKLAYING — C130 (Special)
Prerequisite — This course is for tradesmen interested in improving and upgrading their skills and also for laymen who are interested in the trade.
Course Content — Bonds, preparation of mortars, layout of different types of walls, piers, pilasters, tools and equipment, types of bricks with characteristics and sizes, sand, lime and cement, methods of storage preparation of mortars in cold weather.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

CABINET MAKING — C131 (Special)
Prerequisite — Persons familiar with the fundamentals of cabinet making who are interested in refreshing or upgrading their skills.
Course Content — Conditioning and use of hand tools and machines, joints and methods used in cabinet making, layout and design.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

CARPENTRY I — C132 (Special)
Prerequisite — Must be working as a journeyman carpenter. A theoretical and practical refresher course.
Course Content — House framing and roofing insulating qualities — National Building Code.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

CARPENTRY II — C136 (Special)
Starting October 1970
Prerequisite — Carpentry I.
Course Content — Basic Stair Design and layout — Concrete Practice — Supervisory Responsibilities.
7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

LATHING — C133 (Special)
Prerequisite — This course is designed for tradesmen working at the Trade of lathing interested, in improving their skills and knowledge.
Course Content — Materials of the trade, plastering accessories, tools of the trade, hand, power and bench. Geometry related to trade, drawing of projects. Estimating materials, metal and gypsum, acoustical layouts and component parts of various systems.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PAINTING AND DECORATING FOR THE HOME OWNER — C134 (Special)
This is an elementary course intended to help the small home owner.
Theory:—Safe working practices: choice of scaffold, tools and equipment.
Painting and re-painting of new and old surfaces: Classification of material.
Practical:—Stripping old wallpaper: hanging of wallpaper: painting, staining and varnishing.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee $50.00.

PLASTERING — C135
This course is designed for persons employed in the plastering trade.
Course Content — types of materials, tools, application of plaster, browning and finishing, repairing walls and ceilings, design of cornice moulds, construction of moulds, application of different types of moulds, bench running of moulds, mitring, cutting breaks, geometry related to the trade (arches, niches).
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

INTERIOR DECORATING — C137
Interior Decorating is the organizing of space and equipment for pleasant living. This course is planned to assist today's busy homemaker to improve the efficiency of her home as well as its appearance. Students are encouraged to bring their decorating problems for class discussion.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee $50.00.

ARCHITECTURAL DRAFTING Part I — C150
Course Content — Drafting equipment and procedure, foundation and floor plans for various types of construction, site plans, typical wall section, window details, door details, lathing and plastering details, stair details, fireplace and chimney details, freehand sketching.
Textbook — Architectural Drawing & Light Construction. By: Muller.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ARCHITECTURAL DRAFTING Part II Second Year — C151
This course will be a continuance of the first year with elaboration of topics of the first year and additions of new materials and methods to allow progression to the drawing of a complete set of working drawings for a small industrial building. The emphasis of this course is NOT on aesthetic or structural design but primarily on skill development required to produce a set of working drawings to the highest standard of delineation.
Due to the amount of work required, much of the actual drawing must be done outside the regular hours set for this evening course.
Course Content — Planning drawing layout — presentation drawing in the form of rendered plan and elevation — drawing the plan or plans, elevations, full sections, details and structural drawings.
Prerequisite — Successful completion of the first year course, persons presently employed in the field of architectural drafting at the junior level or graduate of grade 12 Architectural Drafting.
Text: Architectural Drafting and Light Construction by Muller. Publisher — McGraw-Hill.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BUILDING TRADES BLUEPRINT READING — C152
This course is intended for those working in all branches of the building trades and serves as a foundation for further study. It is also of much practical value to people engaged in many fields of business and industry who work in conjunction with the building trades. The content of the course includes the basic principles of drawings and a detailed study of blueprints.
Course Content — orthographic projection, dimensions, pictorial drawing, drawing to scale, symbols and conventions, standard constructions, plan study, construction details, plan reading and interpretation.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

QUANTITY SURVEYING (Part I) AND BUILDING CONSTRUCTION ESTIMATING — (Quantities I) — C153 (CO-10I) (C.I.Q.S.)
Course Content — Mathematics related to take off and estimating. General methods and procedures of taking off quantities for excavation, site works, concrete formwork and masonry.
Textbooks — Method of Measurement of Construction Works (1st & 2nd Editions)
Publisher: Canadian Institute of Quantity Surveyors Construction Estimate from Take Off to Bid — Norman Foster.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

CONSTRUCTION METHODS & MATERIALS — (Building Construction I) — C154 (CO-103) (C.I.Q.S.)
Course Content — Excavation, foundations, brick, concrete and clay tile, rough carpentry and millwork.
Textbook — Materials and Methods of Architectural Construction by Parker, Gay and MacGuire.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

REINFORCED CONCRETE DESIGN (Structural Steel & Reinforced Concrete) — C155
Course Content — Principles of mechanics, forces, stresses, moments and reactions, shear and bending moments, theory of bending and properties of sections. Concrete — manufacture of cement, properties and use of aggregates and additives and placement of concrete. Reinforcing — reinforcing bars, bending and bending schedules and reinforcing bar placement. Reinforced concrete design — stresses in reinforced concrete.
Modulus of elasticity — Design formulas for beams — Diagonal tension and web reinforcement — Bond — Design of rectangular reinforced concrete beams — Alternate design — Web reinforcement for girders — Design of T-beams — One-way solid slabs — Design of one-way slabs — Load tables — Design of ribbed slabs — Design of stair slabs — Design of tied columns — Design of spiral columns — Design of wall footings — Design of independent footings — National Building Code — Interpretation — Application.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SURVEYING Part I — (Surveying and Levelling) — C156 (CO-104)
Course Content — Fundamental principles of surveying, levelling, chaining, use of the transit, bearings and azimuths, field notes, transit surveying, latitudes and departures, calculation of missing courses, calculation of areas D.M.D's earthwork computations, introduction to curves.
Textbook — Simplified Site Engineering. By: Parker and MacGuire.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SURVEYING Part II — C157
Prerequisite — Engineering Surveying I or equivalent.
Course Content — Simple curves, vertical curves, curve intersections, transition curves, stadia surveying, route surveys, area surveys, optics, adjustments of instruments, photogrammetry, observation for meridian.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MUNICIPAL BUILDING OFFICIALS COURSE — BUILDING INSPECTORS — C158 (Special)

This course is designed to train municipal building officials in the areas covering their role as building inspectors based on the National Building Code.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

STRUCTURAL STEEL DESIGN & DETAILING Part I — (Basic Design) — C160

Course Content — Force systems, force analysis of structures, stress and strain, shear and moment in beams, design of simply supported beams — structural steel, plain material, fabrication, bolted and welded connections.

Textbooks — Structural Steel Detailing/AISC. Mechanics of Materials. By: I. J. Levinson.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

STRUCTURAL STEEL DESIGN & DETAILING Part II — C161

Prerequisite — Structural steel design & detailing Part 1 or equivalent.
Course Content — Review of course content Part I. Introduction to columns, combined loading — column details, moment connections, built up members, girders, trusses, graphical and numerical stress solutions, splices for girders & trusses. Camber.
Texts — Structural Steel Detailing/AISC. Mechanics of Materials. By: I. J. Levinson.

Tuesday — 7.00 p.m. to 10.00 p.m. Campus T.

MECHANICAL INSTALLATION I — C162 (CO-102)

Prerequisite — Persons employed in and studying the various aspects of the construction industry. This course is considered a necessity to prepare an individual for the industry.
Course Content — Water, sewage disposal, store drainage, pipe sizing, traps fall, piping materials, couplings, joints, water pressure, plumbing layout, fixtures, ventilation, sprinklers.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SURVEYING & DRAFTING Part I — C164 (Special)

Extension
Prerequisite — Familiarization of surveying.
Course Content — Principles of drafting (a) Use of instruments, (b) Linework, (c) Lettering — freehand, mechanical. Property Plans — Sub-division Plans — Plans of right-of-way — Topography Plans.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PLUMBING BASIC — C300 (Special)

Course Content — Measuring pipe, pipe materials, drainage terms, fundamentals of drainage design, stack terms, footings and terminals, traps and trap seal loss, vents and venting, wastes, sizing, prohibited fittings and connections.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

PLUMBING INTERMEDIATE — C301 (Special)

Course Content — Stack, wet, loop and circuit venting, stack elevation work, grease and oil interceptors, sewage tanks, floor drains, drain plans, water services and meters, B.T.U's, pressures and heads.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

PLUMBING ADVANCED — C302 (Special)

Course Content — Commercial hot water tanks and heaters, circulating lines and pumps, supplies to high buildings, hydropneumatic systems, cross connection, indirect wastes, municipal sewage and water treatment, rural sewage disposal, sizing drains.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

PLUMBING QUALIFICATION — C303 (Special)

This is designed as a refresher course in general plumbing theory and code (Provincial) for those required to write the Ontario Certificate of Qualification examination.

Two nights per week — Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

PLUMBING DESIGN & INSTALLATION — C305 (Special)

This course is designed for those wishing to prepare themselves for the responsibility of a master plumber.
Prerequisite — Journeyman's licence or Ontario Certificate of Qualification.
Course Content — Review of legislation relevant to the construction industry. Examination discussion and interpretation of the Ontario Plumbing Code. Mathematics and physics as necessary to understand design problems. Discounts, overhead and profit applications.

Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

PLUMBING ISOMETRIC AND MATERIAL TAKE-OFF — C319 (Special)

Course Content — Development of scaled piping isometrics and interpretation. Formation of material take-off methods.

Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

SHEET METAL PATTERN DRAFTING Part I — C306 (Special)

This course is designed for apprentices and beginners and covers the basic principles of pattern drafting.
Course Content — Use of drafting equipment by parallel line and radial line developments, oblique cylinder by parallel line method, segmental elbows, by parallel line and radial line methods, oblique cone by radial line method.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

SHEET METAL PATTERN DRAFTING Part II — C307 (Special)

Prerequisite — Previous pattern drafting experience.
Course Content — Regular and irregular tapers, square to round and other transition pieces, tapered elbows of different sections, streamlined fittings, double and multiple branches of different sections, all by triangulation method.

Wednesday — 7.00 p.m. to 10.00 p.m. Campus N.

SHEET METAL THEORY — C308 (Special)

This course is designed to assist apprentices failing to qualify for advancement in the apprenticeship program and also for those preparing to write the Certificate of Qualification Examination.

Two nights per week — Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

SHEET METAL — PRACTICAL SHOPWORK — C309 (Special)

This course is designed to provide an opportunity for apprentices and journeymen to upgrade their skills in the use of bench and power machines and the layout and fabrication of projects.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

SHEET METAL DESIGN AND INSTALLATION — C310 (Special)

This course is designed for those who wish to prepare themselves for the responsibilities of a master sheet metal worker.
Prerequisite — Currently employed in the sheet metal industry with a journeyman standing.
Course Content — Labour legislation in relation to the construction industry — city bylaw — underwriters, definition of terms applied to heating and air conditioning, use of N.W.A. and A.C.A. manuals for heat loss and heat gains, pipe sizing and location of outlets and inlets in residential installation, types of fans, air flow and types of instruments used, calculations in ventilation requirements, heating and pipe sizing by velocity, use of charts and tables.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING BASIC — C311 (Special)

Course Content — Relevant Mathematics and Physics, measuring pipe, valves, boilers, gravity and forced hot water, pumps, one pipe systems, baseboard heating, radiant heating, controls, hydrostatics and hydraulics.

Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING DESIGN AND INSTALLATION — C312 (Special)

This course is designed for those wishing to prepare themselves for the responsibilities of a master steamfitter or who wish to pursue the trade beyond the journeyman level.
Prerequisite — Steamfitting certificate of qualification.
Course Content — Review of hot water and steam systems, introduction to labour legislation pertaining to building trades, codes and regulations, heat loss calculations, radiation selection, design of heating systems, control of systems, introduction to air conditioning.

Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING QUALIFICATION — C313 (Special)

This is designed as a refresher course in general steamfitting theory for those required to write the Certificate of Qualification Examination.

Two nights per week — Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING PNEUMATIC CONTROLS Part I — C314 (Special)

This course is designed for journeymen steamfitters who wish to broaden their knowledge in this specialized field.
Course Content — Elements of control, advantage and performance of pneumatic controls, control drawings, pipe installations, control theory, control applications, control adjustments, air compressors, maintenance of controls.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING PNEUMATIC CONTROLS Part II — C315 (Special)
This course is designed for steamfitters who wish to specialize in this field and those currently engaged in control work.
Course Content — Expansion of course I content, control layout, mechanical blueprint and specification reading, air flow, valve sizing and other necessary related knowledge for designing systems.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING INTERMEDIATE — C316 (Special)
Course Content — Convertors, boiler controls and accessories, steam traps, vacuum pumps, selector and thermostats, pressure reducing valves, feed water heaters, superheaters, high and low pressure systems.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING ADVANCED — C317 (Special)
Course Content — One and two pipe steam systems, return traps and piping, space heating, cooling towers and cycle high pressure generating plants, heat loss calculations.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

STEAMFITTING — PRACTICAL SHOPWORK — C318 (Special)
This course is designed to provide an opportunity for those engaged in the trade to upgrade their skills in the areas of bending, cutting, welding and general fabrication.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

REFRIGERATION — Part I — C520 (Special) Basic
Prerequisite — Applicants should be employed in the refrigeration industry or some allied trade.
Course Content — Refrigeration fundamentals and principles, compression system of refrigeration, properties of refrigerants, metering devices, expansion valves, evaporators, condensers, compressors, flow equipment, electric controls and control valves, lubrication, servicing (charging and evacuation), trouble shooting problems, shop demonstrations of silver brazing.
Text — Principles of Refrigeration — Dossatt.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

REFRIGERATION — Part II — C521 (Special) Intermediate
Prerequisite — Successful completion of Refrigeration Part I or equivalent experience.
Course Content — Review of fundamentals, defrosting methods, compressor drives, instruments and meters, piping and refrigerant lines, pressure drops, heat calculations refrigerated enclosures, survey or refrigeration applications, humidity in refrigeration, cooling load calculations, secondary refrigerants, liquid cooling, absorption systems, codes and by-laws, safety precautions.
Text — Principles of Refrigeration — Dossatt.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

REFRIGERATION — Part III — C522 (Special)
Prerequisite — Refrigeration II.
Course Content — Roof top condensers, piping systems, brines, pumps, chillers, centrifugal compressors, heat pumps, symbols, starts and contactors, packaged units, humidifiers, dehumidifiers, spray apparatus, ponds, air cleaning equipment electronic and curtain, odour control. Load calculation, commercial and air conditioning, selection of equipment, pneumatic systems, control circuitry, trouble shooting, safety.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

AIR CONDITIONING DESIGN — Part I — C523
This course is designed to cover the basic theory of air conditioning system design. It is of practical use to engineers, technicians, designers and draftsmen employed with consulting engineers, manufacturers and contractors in the air conditioning industry.
Prerequisite — Applicants should have a reasonable knowledge of mathematics at the Grade X level.
Course Content — Psychrometers, heating and cooling load calculations, low pressure duct design, fan laws, basic refrigeration cycle, reciprocating compressor selection, air conditioning equipment selection.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

AIR CONDITIONING DESIGN — Part II — C524
Prerequisite — Successful completion of Part I or equivalent experience.
Course Content — Centrifugal compressors, absorption machines, multi-office air conditioning systems, induction system design, high velocity duct design, water piping systems, control systems, water treatment, sound and vibration. This course includes a Conduit Weathermaster System Design Project.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

GAS FITTER (Pre-Licence) — C725 (Special)
This course is designed for persons presently engaged in the heating or appliance field, who wish to obtain the necessary knowledge to write the Department of Energy & Resources management gas fitters examination.
Course Content — Properties of natural gas — fundamentals of combustion — gas piping — venting — appliance requirements — fundamentals of gas controls — conversion burners — commercial and industrial utilization — service problems — shop work.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

WARM AIR HEATING AND AIR CONDITIONING (Domestic) — C726 (Special)
Prerequisite — Grade X or equivalent.
This course is provided for persons who have a general knowledge of house construction and the problems related to domestic heating. Persons who may be connected with the heating industry who wish to acquire a working knowledge of the basic and more advanced techniques involved in the design and application of warm air heating and air conditioning systems and equipment.
Course Content — Heat loss and heat gain calculations by N.W.A. Methods — Components, equipment and controls for heating and cooling, system specifications, zoning and duct sizing by N.W.A. Manuals — "A" and No. 9 Use of the Equal Friction Charts. Uses of the Psychrometric Chart. Humidification and Dehumidification. The Heat Pump. Air Cleaning. System Balancing.
Monday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.
Fee $40.00.

OIL BURNER — Part I — C727 (Special)
This course consists of approximately 40% theory and 60% shop and is designed to prepare students to write examinations for Oil Burner Servicing Licence Class III.
Prerequisite — Grade X or working with associated trades.
Course Content — Types of Domestic burners — parts of burners — filters — purpose of controls — settings for basic controls — fuel line problems — safety precautions — public relations — procedure for annual conditioning.
Tuesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

OIL BURNER — Part II — C728 (Special)
This course consists of approximately 50% theory and 50% shop. It is designed to prepare students to write the examination for Oil Burner Servicing Licence Class II.
Prerequisite — Oil Burner I or satisfactory experience.
Course Content — Theory of combustion — types of burners — fuel units — transformers — combustion chambers — nozzles — tank installations — controls — heating systems — wiring diagrams — service procedures — regulations — public relations.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

COMMERCIAL AND INDUSTRIAL OIL BURNERS — C729
This course is designed to prepare students to write the examination for Oil Burner License Class I.
Prerequisite — Oil Burner Class II License.
Course Content — Properties of commercial fuel oils, types of burners, preheaters, burner selections, flue gas analysis, combustion control, non-programming, sequence, programming schematic piping and wiring diagrams of combustion systems, tank installations, service analysis and regulations.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

GAS APPLIANCES — C730
Prerequisite — Grade X or equivalent.
Course Content — Gas ranges, classification and types, gas range adjustment and servicing, tip burner adjustments, simmer adjustments, low temperature oven burner adjustments, oven heat control, broiler adjustments, burner valves, range pilots, by-pass flame adjustments, automatic gas range ovens, Electrical, schematic wiring diagrams, circuit testing and fault finding, gas dryers, classification and types, gas dryer operation, dryer controls, thermostat, timer, door switch, solenoid valve, warp safety switch, dryer installation, gas connection, exhaust system, electrical systems, schematic wiring diagrams, circuit testing and fault finding, miscellaneous appliances, gas refrigerators, gas fired incinerators, gas lamps, LP conversion.
Monday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D. Commencing February, 1970.

COMMERCIAL AND INDUSTRIAL GAS — C731 (Special)
Prerequisite — Applicants should have a Gas Fitters License and be employed in the industry.
Course Content — Fundamentals of combustion control, flame detection devices, firing systems, firing sequences and programs, logic diagrams, combustion controls, non-programming and programming, gas fired conversion burners and boilers, boiler classification and terminology, input calculations, burner installations, flue gas analysis and boiler efficiency, types of conversion burners and package boilers, required CGA valve train assemblies.

schematic wiring diagrams, commercial hot water heaters, type, hot water heaters selection (calculations), mixing valves and accessories, gas controls, commercial hot water systems, miscellaneous equipment, multiple hot water heating units, infra red burners, make-up air heaters and gas fired air conditioning.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

PROPANE GAS — C732 (Special)
Prerequisite — Gas Fitters License for natural gas.
This course is designed to prepare the student to write the examination for the Propane Gas Fitters License.
Course Content — Properties of propane gas, basic requirements for field approved appliances, propane piping and tubing requirements, review of ventilation and combustion air, general requirements for appliances. Storage and handling — cylinder filling, location and storage, propane tanks, accessories and equipment. Transports and tank trucks and the transportation of propane. Propane as an engine fuel, vapourizers, indirect and direct fired, cylinder systems for highway mobile vehicles. Review of basic domestic gas burner controls and heating system. Review of the domestic hot water heater.
Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

HYDRONIC HEATING — C733 (Special)
Prerequisites — Grade X or equivalent.
This course is provided for persons wishing to gain a working knowledge of the design techniques for residential hot-water heating systems.
Course Content — The I-B-R Detailed and Modern methods of heat loss calculation. Components, equipment and controls. Design of "Series Loop Systems", "One-Pipe systems" and "Two-Pipe Reverse Return systems".
Monday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

THE FLOORCOVERING INDUSTRY
This is a growing industry with job opportunities in both sales and installation. There are two classes of installation work, residential and commercial. In the cities the work is quite specialized but in the rural areas a man skilled in the installation of sheet vinyl and linoleum as well as in carpet can make a very good living. This combines well with the upholstery business. The great increase in wall-to-wall carpeting has created a further demand for on location carpet cleaners.
Please contact Mr. W. C. Wilson re courses. Telephone 677-4565.

APPLIANCE SERVICING Part I (Electrical Fundamentals and Small Appliances) — C172 (Special)
Prerequisite — Grade X or satisfactory equivalent.
Course Content — Nature of Electricity, Basic Electrical Quantities, Ohm's Law and its application, Electrical Circuits, Magnetism and Electromagnetism, Electrical Circuitry and Fault Finding, Motors, Power and Heating Effects, Electrical Measuring Instruments, Various Switching Devices, Theory and Repair of Small Appliances.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

APPLIANCE SERVICING — (Domestic Refrigeration) Part II — C173 (Special)
Prerequisite — Grade 10 or equivalent.
Course Content — Fundamentals, Compression system of Refrigeration, Refrigerants, Liquid Feed Devices, Evaporators, Compressors, Condensers, Electric Motor Controls, Defrosting Methods, Food Preservation, Evaluating and Charging, Leak Testing, Dismantling and Assembling procedures for Refrigerators and Air Conditioners, Circuit Tracing, Fault Finding, Service Analysis.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

APPLIANCE SERVICING — (Laundry and Kitchen Equipment) Part III — C174 (Special)
Prerequisite — Satisfactory completion of Part I or equivalent.
Course Content — Theory and Operation of Wringer and Automatic Washers, Dryers, Ranges and Dishwashers, Fault Finding and Repair Procedures, Circuit Tracing, Service Analysis.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

COURSES OFFERED AT 33 BLOOR STREET EAST

FUNDAMENTALS OF COUNSELLING — CB70
This course is designed for persons who are required to assume counselling responsibilities. The course would be of interest to welfare workers, youth workers, Children's Aid workers, personnel officers, Canada Manpower counsellors.
Course Content — General introduction, survey of related social sciences, human growth and behaviour, counselling techniques, tests and testing, commnuity resources, case studies, summary session.
Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus B.

EFFECTIVE SPEAKING — CB71
This course is of practical value to salesmen, foremen, supervisors, and men and women who are required to speak to groups of people. The principles that guide oral communication will be studied. The course will be adapted to meet the needs of the individual student in a wide variety of real-life speaking occasions.
Course Content — Factors in delivering a speech, informative speeches, impromptu talks, persuasive and sales talks, debate and argument, running for office, speech formulas.
Monday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus B. Fee $26.00.

PRE-TECHNICAL ENGLISH — CB72
The course is intended for men and women who have had little opportunity for early education in the fundamentals of English language skills and who wish to upgrade their English so that they may qualify for a technical or commercial course.
Prerequisite — sufficient command of oral English to function in a classroom situation.
Course Content — Includes reading skills, oral expression, written expression, word study, spelling problems, vocabulary enlargement, pronunciation, use of the dictionary and reference materials, handwriting, and the fundamentals of sentences, punctuation, and practice in correct usage.
Monday through Friday — 8.00 a.m. to 2.30 p.m. four weeks Campus B.
Note — Courses begin the first Monday of each month.

PRE-TECHNICAL MATHEMATICS — CB73
The course is intended for men and women who have had little opportunity for early education, and who wish to upgrade their arithmetic skills to enter a technical or commercial course.
Course Content — Review of fundamental operations of addition, subtraction, multiplication, and division dealing with whole numbers, fractions, decimals and percentage, basic units of measurement, simple problems based on the operations mentioned above.
Monday through Friday — 8.00 a.m. to 2.30 p.m. four weeks Campus B.
Note — Courses begin the first Monday of each month.

BUSINESS AND COMMERCIAL TECHNOLOGY

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.
Courses in English, Mathematics and Science for technical and commercial students covering the grade levels from 9 to 12 are designed for those who,

(a) wish to obtain credits towards a high school graduation diploma.
(b) require some or all of these to gain entrance to a trade or specialized commercial course or,
(c) have a contract with the Canada Manpower Centre requiring specific grade levels for upgrading.

Students possessing partial high school credits in these subjects will be assisted in selecting the most suitable level at which to start. Those lacking a grade 8 certificate are expected to take these subjects in the pre-high school courses which are designated CB.

BOOKKEEPING "A" — CBI0 (CB & CI00)
The purpose of this course is to upgrade students to the Grade 9 level for entry to subsequent commercial courses.
Prerequisite — Grade 6-7 or equivalent.
Course Content — Basic skills of penmanship and writing of numbers, cash book, savings and current bank account, banking information, personal and family records, basic sales records, invoices, payroll records, stock records.
The balance sheet, assets, liabilities, capital, the account, debits, credits, the ledger, the profit and loss statement, income, costs, expenses, the trial balance, the general journal, the general ledger, posting, the six-and-eight-column work sheet, adjustments, adjusting and closing the books.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BOOKKEEPING B — CBII (C200)
The purpose of this course is to study the basic bookkeeping principles — for students in the Grade 10 commercial program.
Prerequisite — Grade 9 or the equivalent.
Course Content — Cash receipts journal, cash payments journal, purchases journal, sales journal, accounts receivable ledger and its control account, sales returns and allowances journal, accounts receivable summary, accounts payable ledger and its control account, purchases journal, purchases returns and allowances journal, accounts payable summary, cash journals and cash discounts, the six-column general journal.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BOOKKEEPING C — CBI2 (C300)
The purpose is to study the basic bookkeeping principles — for students in the Grade II commercial program.
Prerequisite — Grade 10 or the equivalent.
Course Content — Drafts and promissory notes, imprest system of petty cash and multi-column cash journal, bank reconciliation.
Special adjustments: bad debts, depreciation of fixed assets, prepaid expenses, deferred expenses, accrued expenses and income, adjusting, closing and reversing entries, 10-column work sheet.
Classified financial statements, partnerships, payroll, special columnar journals, voucher system, synoptic journal, bookkeeping for non-trading organization.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

BOOKKEEPING D — CBI3 (C400)
The purpose is to study basic bookkeeping and accountancy — for students in Grade XII commercial program.
Prerequisite — Grade XI or equivalent.
Course Content — Adjustments and preparation of financial statements, allocation of costs of inventories and fixed assets, partnership, revaluation of assets, goodwill, sharing of profits, termination of partnership, realization and distribution of assets, limited companies, organization, incorporation, common and preferred stock, par and no-par value, conversion from partnership, distribution of profits, financial statements, bonds, short-term investments, accounting for manufacturing concerns, voucher system, analysis of financial statements.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

MACHINE SHORTHAND
Machine shorthand or touch shorthand is a very modern and efficient system widely used in the United States and other countries. It is not new but is a well-established system that has been in use for over fifty years. It is written on the stenograph machine, a small, rugged, silent, non-electric machine which prints at high speed the familiar letters of the alphabet. What the typewriter has done for the pen this machine is doing for shorthand. The keyboard permits a number of letters, words and phrases to be printed at one stroke. The notes are permanently printed on paper, then transcribed on the typewriter or filed for future transcription.
With further practice following the Secretarial Course in Machine Shorthand, the attainment of high speeds is possible, opening up the highly paid fields of court reporting, reporting for commissions, conventions, meetings, arbitration hearings and so on.

MACHINE SHORTHAND — THEORY — CB14 (SMTI)
The purpose is to provide a basis for the development of speed in shorthand.
Prerequisite — Grade 12 English or equivalent.
Course Content — The basic fundamentals of the theory of Machine Sbortband, common short-forms and phrases.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

MACHINE SHORTHAND — ELEMENTARY SPEED LEVEL — CBI5 (SMS-I)
This course is offered to those persons desiring to develop facility in writing machine shorthand at speeds up to 80 words per minute.
Prerequisite — Completion of STM1 or equivalent, plus Grade 12 English or equivalent, and 45 words per minute in typewriting.
Course Content — Development of facility in writing and reading shorthand notes using simple commercial vocabulary. Practice in transcribing notes at tbe typewriter in acceptable mailable form.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

MACHINE SHORTHAND — INTERMEDIATE SPEED LEVEL — CB17 (SMS-2)
The purpose is to develop the facility of writing shorthand of average commercial difficulty at speeds up to 100 words per minute and transcribing notes at the typewriter in acceptable, mailable forms.
Prerequisite — Completion of SMS1 or equivalent, plus Grade 12 English or equivalent, and 50 words per minute in typewriting.
Course Content — Development of facility in writing and reading shorthand notes. Practice in transcribing notes at the typewriter in acceptable, mailable form.
Moday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

REFRESHER COURSE — THEORY OF PITMAN SHORTHAND — CBI6 (SPT2)
This course is specially designed for those who have bad Pitman Shorthand in the past, but require a quick review before going on to writing at speed.
Prerequisite — Grade 12 English or equivalent — a reasonable knowledge of the theory.
Course Content — Quick review of the principles of Pitman shorthand. Emphasis on facility in the use of short forms, contractions, intersections, and phrases.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

PITMAN SHORTHAND — INTERMEDIATE SPEED LEVEL — CBI8 (SPS-2)
The purpose is to develop the facility of writing shorthand of average commercial difficulty at speeds up to 100 words per minute, and transcribing from notes to the typewriter.
Prerequisite — Completion of SPS1 or equivalent, and 50 words per minute in typewriting, plus Grade 12 English or equivalent.
Course Content — Development of facility in writing and reading shorthand notes in the 2,000 word vocabulary level with additional practice in the writing of a more extensive vocabulary. Office style dictation. Practice in transcribing notes at the typewriter.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

PITMAN SHORTHAND — THEORY — CBI9 (SPT-I)
The purpose is to provide a basis for the development of speed in writing shorthand.
Prerequisite — Grade 12 English or equivalent.
Course Content — The basic fundamentals of the theory of Pitman shorthand, common short forms, and phrases. Particular emphasis is placed on the development of a high frequency vocabulary common to all dictation.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

PITMAN SHORTHAND — ELEMENTARY SPEED LEVEL — CB20 (SPS-I)
This course is offered to those persons desiring to develop facility in writing shorthand at speeds up to 80 words per minute.
Prerequisite — Completion of SPT1 or SPT2 or equivalent, plus Grade 12 English or equivalent, and 45 words per minute in typewriting.
Course Content — Development of facility in writing and reading shorthand notes with particular emphasis on the 1,500 common-word vocabulary. Practice in transcribing notes at the typewriter.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

DATA PROCESSING — CB25 (E.D.P. I Keypunch and Verifier)
The purpose is to bring the student to a high standard of accurate speed and machine familiarity so that the operator will be able to produce an acceptable quantity of high quality work on tbe I.B.M. Keypunch and Verifier.
Prerequisite — Grade 10, 35 words per minute typewriting speed and a passing mark on the I.B.M. Keypunch operators test.
Course Content — 20 taped lessons prepared by I.B.M. for Keypunch Models 024, 026, 029, 059 and 056 Verifier. The operation and names of the various parts of the machines.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T and D.

DATA PROCESSING — CB26 (E.D.P. II Basic Unit Records)
The purpose is to acquaint the student with some objectives of a typical commercial E.D.P. installation. Unit record techniques are presented as one means of attaining these objectives.
Prerequisite — Grade 12 and knowledge of basic bookkeeping and a minimum score of 29 on the I.B.M. Punched Card Machine Operator Aptitude Test.
Course Content — Functional wiring principles and the functions of printing, punching, comparing and selection for I.B.M. Models 077, 083, 088, 402, 514, and 548.
Techniques of machine operation, flowcharting, problem analysis, planning card layouts, diagnosis of errors using typical accounting applications.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

DATA PROCESSING — CB27 (E.D.P. III Advanced Unit Records)
The purpose is to increase proficiency and experience on unit record equipment and to develop work habits which will enable the student to work with a minimum of supervision.
Prerequisite — Successful completion of E.D.P. II and classification as Unit Record Operator Trainee.
Course Content — More complex techniques on Models 077, 088 and 402, Design of a card file and processing of same through all machines considered in the course.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

DATA PROCESSING A — CB28 (E.D.P. IV Basic Computer Concepts A)
The purpose is to expose students to all phases of the E.D.P. cycle, including programming and operating, to develop the ability to discuss an E.D.P. problem intelligently at any level.
Prerequisite — Successful completion of E.D.P. II and classification as Computer Operator Trainee.
Course Content — Introduction to various I/0 devices, concepts of computer operations, systems flow charts and block diagrams, design of files for various I/0 media, coding, case problems, visit to computer centre to test programme.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

DATA PROCESSING B — CB29 (E.D.P. IV Basic Computer Concepts B)
The purpose is a continuation of advanced work as shown in CB28.
Prerequisite — Successful completion of CB28 or equivalent.
Course Content — Advanced work to various I/0 devices, concepts of computer operations, systems flow charts and block diagrams, design of files for various I/0 media, coding, case problems, visit to computer centre to test programme.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

BUSINESS MACHINES — CB35 (Accounting Machines)
The purpose is to introduce students to machine accounting procedures and to develop an operating speed which will be acceptable to industry.
Prerequisite — Grade 10 and a typewriting speed of at least 35 words per minute.
Course Content — Instruction and practice in machine operation through the use of pre-recorded tapes and practical exercises. Accounts receivable, Accounts payable, Journal distribution and payroll are taught using the following accounting machines:
National Cash Model 3300
Burroughs Sensimatic Models F 1100, F 6100
Olivetti-Underwood Model 1502
Monroe-President Model 145B
Smith Corona Marchant Model 602
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

BUSINESS MACHINE A — CB36 (Comptometer A)
The purpose is to develop a fast accurate comptometer operator who upon completion of the course will be employable by industry.
Prerequisite — Grade 10
Course Content — Instruction and practice in addition, subtraction, multiplication and division. Operating techniques, regular speed and progress tests. All practice material to be representative of today's work in industry.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

BUSINESS MACHINE B — CB37 (Comptometer B)
The purpose is to develop a fast accurate comptometer operator who upon completion of the course will be employable by industry.
Prerequisite — Completion of CB36 or equivalent.
Course Content — Advanced work in addition, subtraction, multiplication and division. Operating techniques, regular speed and progress tests. All practice material to be representative of today's work in industry.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

BUSINESS MACHINES C — CB38 (Duplicating Machines)
The purpose is to acquaint the student with current duplicating procedures and techniques which are employed in today's modern office.
Prerequisite — Grade 10 plus an acceptable typewriting speed.

Course Content — Preparation of masters and stencils using Xerox, typewriter and plate making equipment, line justification and error correction procedures. Operational maintenance and techniques of the Xerox 914, Offset Press, Mimeograph and Spirit Duplicator.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 120 hrs. Campus T.

BUSINESS MACHINES D — CB39 (Printing and Rotary Calculator)
The purpose is to develop competent calculator operators with an acceptable operating speed and the ability to solve mathematical business applications as related to calculators.
Prerequisite — Grade 10.
Course Content — Instruction and practice to develop 10 key and full keyboard ease of operation, all phases of addition, subtraction, multiplication and division as related to practical business applications taught with the following equipment:
Friden, Monroe, Olivetti-Underwood, Smith Corona, Marchant and Victor
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

TYPEWRITING A — CB45 (Beginning Typewriting)
The purpose is to: (a) achieve a thorough mastery of the keyboard using the touch system, plus an introduction to basic typewriting setups. (b) achieve 25 words per minute on 5-minute tests.
Prerequisite — Basic knowledge of English.
Course Content — All the keys will be taught with special emphasis on the touch system (posture, good stroking, rhythm and correct fingering are an integral part.) The names, care, and proper manipulation of the parts of the machine will be introduced as required. The rules of syllabication and capitalization, an introduction to basic centering, tabulation and letters, plus typing of value for personal use. The speed objective is 25 words per minute on 5-minute tests.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

TYPEWRITING B — CB46 (Advanced Typewriting)
The purpose is to: (a) further develop typewriting skills and to concentrate on more advanced typewriting setups. (b) achieve 40 words per minute on 10-minute tests.
Prerequisite — 25 words per minute or Typewriting I
Course Content — During this course, emphasis will be placed on practical typing of tabulation — tables, financial statements, centering — menus, programs, announcements, business letters — different styles, placement, carbon copies and envelopes, essential business forms, erasures and corrections, squeezing and spreading, duplicating — the typing of dittos, stencils and offset masters.
In addition, skill development to bring the typist up to 40 words per minute or better on 10-minute tests.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

OFFICE PRACTICE A (Stenographic) — CB47 (Grade XI)
The purpose is to familiarize the student with the requirements, the characteristics, and the organization of business offices and the duties most frequently preformed.
Lecture time is to be kept to a minimum and practical assignments are emphasized.
Prerequisite — 40 words per minute on a ten-minute test.
Course Content — Different types of filing systems and procedures involved in filing — ship, purchasing, sales and accounting routines, the stenographic, administrative, and receptionist duties of a secretary, sources of information, reports, manuscript typing and proof-reading.
Familiarization with the services — postal, telephone, telegraph, cable and wireless, and banking — used by employers. More advanced typing theory with emphasis on typing from corrected copy/manuscript work, typing of balance sheets and financial statements with insertions made in red, and memorandum.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

OFFICE PRACTICE B (Stenographic) — CB48 (Grade XII)
The purpose is to give the student a thorough familiarization with filing techniques and other duties performed by secretaries.
Lecture time is to be kept to a minimum and practical assignments are emphasized.
Prerequisite — Office Practice I or equivalent.
Course Content — Business organization — classification of business and types of owner-prepatory filing steps, cross-reference, etc. The emphasis in the filing instruction is on completing practical, office-type assignments. Familiarization with the different kinds of office machines — reproduction processes and machines, and dictating and transcribing machines.
Emphasis is also laid on the personal work met of the student, as secretary, might be called upon to perform for her employer and includes such items as travel arrangements — typing itineraries, secretarial duties, expense reports, preparing legal documents — affidavits, endorsements, wills, etc., arranging meetings — agendas, memos, minutes, and a general review of office standards, grooming and deportment.
Tuesday and Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

DICTAPHONE (Stenographic) — CB49 (Dictatypist)

The purpose is to prepare the student to become accredited Dictaphone secretary, with an initial capacity of 60 fifteen-line letters a day.
Prerequisite — A thorough knowledge of Business English, spelling and setup of letters (minimum of Grade XI) plus a typing speed of 45 words per minute.
Course Content — Typing from dictabelt records put out by the Dictaphone Corporation. These belts include material on the following subjects:

1. General Business Communications
2. Secretarial Requirements
3. Office Memoranda
4. Transportation
5. Entertainment Industry
6. Advertising and Publishing
7. Communication Industry
8. Banking and Insurance
9. Packaging
10. Automotive Industry
11. Metals Industry
12. Textile Industry
13. Education
14. Science and Engineering
15. Social Service and Welfare
16. Government
17. Medicine
18. Law

In addition, the dictatypists are required to complete the Grade XI course in Office Practice as well as work in the Practice Office.
Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SCIENCE A — CB78 (T-100)

The purpose is to upgrade technical students for entry to subsequent technical courses, to achieve Grade IX level.
Prerequisite — Grade VIII Science or equivalent.
Course Content — Scientific method, properties of matter, air. Introductory heat, magnetism, electricity, sound.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SCIENCE B — CB79 (T-200)

The purpose is to upgrade technical students for entry to subsequent technical courses, to achieve Grade X level.
Prerequisite — Level I science or equivalent.
Course Content — Extension of level I heat. Combustion and slow oxidation, solutions. Introductory metals and alloys, force, work, energy, power and light.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SCIENCE C — CB80 (T-300)

Purpose — Upgrade technical students for entry to subsequent technical courses (i.e. Grade XI).
Prerequisite — Level 2 Science or equivalent.
Course Content — Measurement. Introductory Newtonian mechanics, hydrostatics, refrigeration. An extension of Level 2 light and Level 1 electricity and magnetism including electromagnetism and introductory electronics.
Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

SCIENCE D — CB81 (T-400)

Purpose — Upgrade technical students for entry to subsequent technical courses (i.e. Grade XII).
Prerequisite — Level 3 Science or equivalent.
Course Content — Physical and chemical changes, oxygen, nitrogen, hydrogen, water, solutions and mixtures, fundamental chemical laws, symbols, formulae, equations, ionization, carbon, fuels, sulphur, salt, halogens, periodic table, alkali metals, nitrogen and phosphorous, calcium and magnesium, chemistry in industry.
Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus T.

MATHEMATICS A — CB82 (CB)

The purpose is to upgrade students for entry into grade IX level technical and commercial classes, to bring them to grade VIII level.
Prerequisite — Grade VI.
Course Content — Fundamental operations of addition, subtraction, multiplication, and division of whole numbers, fractions and decimals. Percentage. Simple business problems. Mensuration tables. Introduction to geometry.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS B — CB83 (T100)

The purpose is to upgrade technical students to a grade IX level.
Prerequisite — Grade VIII.
Course Content — The positive number system and the operations of adding, subtracting, multiplying and dividing, extension of the number system to include negative numbers, the index laws for positive indices, equations of the first degree, solutions of practical problems requiring equations.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS C — CB84 (T200)

The purpose is to upgrade technical students to a Grade X level.
Prerequisite — Grade IX.
Course Content — Simplification of algebraic expressions, solution of fractional equations, index laws extended to include negative indices, scientific notation, graph of a straight line, solution in two unknowns, fundamentals geometric constructions, study of the right angled triangle, similar figures, plane mensuration, the tangent ratio, use of trignonometry tables to solve problems on height and distance, introduction to the slide rule.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS D — CB85 (C100)

The purpose is to upgrade students to a grade IX level in commercial mathematics.
Prerequisite — Grade VIII.
Course Content — Addition, subtraction, multiplication, and division of whole numbers, fractions, decimal fractions, aliquot parts, basic algebra and simple equations, ratio proportion and percent, simple interest, bank account and services, practical measurements, perimeter, and area.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS E — CB86 (C200)

The purpose is to upgrade commercial students to a grade X level in commercial mathematics.
Prerequisite — Grade IX.
Course Content — Fundamental operations with whole numbers and fractions, decimal fractions and aliquot parts, elementary algebra, solution of simple equations, ratio, percentage, simple interest, banking and borrowing, retailing, commission, profit and loss, mark up and gross margin, practical measurements.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS F — CB87 (C300)

The purpose is to upgrade commercial students to a grade XI level in commercial mathematics.
Prerequisite — Grade X.
Course Content — Elementary algebra, solution of equations, problems solved by equations, commercial arithmetic and short methods, perimeter and area, volume, business graphs, averages, simple interest, borrowing money, profit and loss, commission, storage, insurance, trade discount.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS G — CB88 (C400)

The purpose is to upgrade commercial students to a Grade XII level in commercial mathematics.
Prerequisite — Grade XI commercial mathematics.
Course Content — Algebraic re-arranging of formulas, municipal taxation, home ownership, income tax, foreign exchange, excise and federal sales tax, excise and customs duties, stocks and bonds, compound interest, ordinary annuities, annuities due, computation using logarithms.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH A — CB90 (CB)

The purpose is to upgrade commercial and technical students to subsequent commercial and technical courses.
Prerequisite — Grades VI-VII or equivalent.
Course Content — Reading skill development — SRA Reading Laboratory. Basic grammar, verb tense, subject-verb agreement, parts of speech, complete vs. incomplete sentences. Basic use of punctuation, apostophe and capitals. Use of dictionary. Basic Vocabulary. Paragraph writing, topic sentences, unity and coherence. Short stories, with emphasis upon comprehension.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH B — CB91 (C100)

The purpose is to upgrade commercia students to subsequent commercial courses and for Grade 12.
Prerequisite — Grade VIII or equivalent.

Course Content — Paragraph writing — topic sentences, unity, coherence. Short essay writing, emphasizing interest and organization. Grammar on a functional basis — a detailed study. Punctuation. Reading skill development. Personal business letters — style, tone, paragraphing in letters of inquiry, request, complaint. Use of dictionary. Summary writing. Oral communication skills. Short stories or a novel — emphasis upon comprehension, use of language, character, plot.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH C — CB92 (C200)

The purpose is to upgrade commercial students to subsequent commercial courses and for Grade X.
Prerequisite — Grade IX or equivalent.
Course Content — Personal and general business correspondence: a) tone, paragraphing, and styles, b) order, inquiry, request, complaint, appointment, application and recommendation letters. Summary writing. Reading for comprehension and speed. Descriptive, expository and narrative writing. Logic and argument. Business vocabulary. Sentence variety, balanced, loose, periodic, parallel structure. Oral communication. Review of grammar. Detailed study of punctuation. Telephone technique. Novels or plays — emphasis upon comprehension, structure, and technical concepts.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH D — CB93 (C300)

The purpose is to upgrade commercial students for subsequent commercial courses and to completion of Grade 12.
Prerequisite — Grade X or equivalent.
Course Content — Business letters, remittance, acknowledgement, refusal, adjustment, replies to routine letters, etc. General and business vocabulary. Oral and written reports. Extensive study and writing of essays — expository and argument. Reading for comprehension and speed. A detailed review of essential grammar and punctuation. Logic and argument. Communication skills — short talks, discussions. Twentieth century plays and novels.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH E — CB94 (C400)

The purpose is to upgrade commercial students for subsequent courses and completion of Grade XII.
Prerequisite — Grade XI or equivalent.
Course Content — Business letters, complaint and adjustment, circular and form letters, collection, credit and credit refusal, sales, and social-business letters. Memorandums. Report writing. Oral communication skills — debates, panels, talks, etc. Reading for comprehension and speed. Evaluation of current media, newspaper, television, cinema, magazines and radio. Discussion of current issues. Using the library. Research projects. Twentieth century plays and novels.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

STENOGRAPHIC ENGLISH A — CB95 (Level I (Grade XI)

The purpose is to prepare clerk-typists for employment, to prepare dicta-typists and shorthand students for further specialized training.
Prerequisite — Grade X or equivalent.
Course Content — Brief review of grammar, detailed study of punctuation, business vocabulary, basic rules and requirements of business correspondence, application letters, letters of acknowledgement, order remittance, inquiry, request, everyday business letters, order, inquiry, cancellation, confirmation, remittance, request, transmittal, interoffice memorandums, report writing, oral work — informal and formal.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

STENOGRAPHIC ENGLISH B — CB96 (Level II (Grade XII)

The purpose is to prepare shorthand students for employment as stenographers.
Prerequisite — Level I or equivalent.
Course Content — Letters of refusal, credit and collection letters, claim, adjustment, sales, social business and form letters, continuation of interoffice memorandums, report writing, detailed study of punctuation, business vocabulary, oral work — mock interviews, telephone technique, prepared talks, discussions and debates.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH X — CB97 (T100)

The purpose is to upgrade technical students to subsequent technical courses and completion of Grade 12.
Prerequisite — Grade VIII or equivalent.
Course Content — Paragraph writing — topic sentence, unity, coherence, general science vocabulary. Short essay writing, emphasising interest and organization. Grammar on a functionable basis — a detailed study. Punctuation. Use of dictionary. Reading skill development. Oral communication skills — discussions, short talks, etc. Short stories or a novel — emphasis upon comprehension, use of language, character, plot.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH Y — CB98 (T200)

The purpose is to upgrade technical students to subsequent technical courses and to completion of Grade X.
Prerequisite — Grade IX or equivalent.
Course Content — Paragraph and essay writing: descriptive (scientific and literary), narrative and expository. General science vocabulary. Grammar and punctuation in context. Logic and argument — simple oral and written reports about technical matters. Summary writing. Personal business correspondence: 1) style, tone, paragraphing, 2) order, inquiry, complaint, and application letters. Oral communication skills. Reading skill development. Analysis of current media: T.V., film, radio, newspaper. Novels and plays — emphasis upon comprehension, structure and technical concepts.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

HISTORY AND PHILOSOPHY OF EDUCATION I — CB105

Course Content — Interpretation and evaluation in history — criteria of social progress and of a "good" education relevance of philosophy — three basic positions, four contemporary positions, existentialism and "analysis". Our legacy from the past.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee $50.00.

HISTORY AND PHILOSOPHY OF EDUCATION II — CB106

Course Content — Forerunners of Modern Education — schools for all, romantic naturalism, child-centred school, self-expression and a science of education. Equality of educational opportunity, the liberal practical" controversy, progressivism. Continuing issue in Canadian (Ontario) education. Education today and what of tomorrow.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T. Fee $50.00.

ECONOMICS I — CB107

Aim is an understanding of economic environment. The forces determining the size, pricing and distribution of the nation's production will be examined. Some attention will also be given to the problems of economic growth and development and to alternative economic systems. Emphasis will be on developing an analytical ability to comprehend complex social situations rather than the memorization of readily available material. The organization and functioning of the Canadian economy as a whole and the individual establishment within it. Analysis and discussion on the following:
Business organization, different types of business enterprises, securities and corporation finance; fixed, variable and marginal costs and the equilibrium of the establishment under different conditions; break-even charts; budgeting; site and locations, marginal analysis and the combining of effort of men, machines and materials; supply and demand; money and banking; public finance, different economic systems.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ECONOMICS II — CB108

Continuation and deeper exploration of I.
An investigation of different methods of raising funds. Analysis of the importance of financial institutions promotion, security, capital budgeting. Decision making analysis. Surplus, dividend and reserve policy. Institutions such as banks, credit unions, trust and loan companies will be investigated and discussed. Analysis of each and its part in providing short, intermediate and long-term credit needs. Debentures.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BUSINESS MANAGEMENT I — CB109

Course Content — The nature of theory, the communication process, communication channels, characteristics of the Decision-Making process. The legal and structural setting of education, the essentials of bureaucracy, five myths of organization.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BUSINESS MANAGEMENT II — CB110

Prerequisite — Business Management I
Course Content — Review of I, the problems of internal organization control, work and society problems of supervision, scope and character of Administration leadership, leadership tactics, some socialogical foundations of leadership, societal influence, evaluation and morals, avenues of success, professional persons in public organizations.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ACCOUNTING I — CB100

A study is made of accounting procedures and the forms of business organization. The balance sheet is first diagnosed, then accounts and their debt and credit components are introduced. Transactions are journalized and posted to accounts. Changes in ownership due to revenue and expenses, income or loss are studied followed by preparation of the income statement. Working papers are used to make year end adjustments and prepare financial statements. Adjustments include accrued revenues, accrued expenses, revenue and cost apportionment; depreciation and bad debt allowances; preparation of statements includes principles of disclosure and correct presentation. Special journals are introduced and also subsidiary ledgers with general ledger controlling accounts.

The full bookkeeping cycle is performed with individual proprietorships, with partnerships and with limited companies. Formation, running, division of profits and liquidation of partnerships are studied. Formation of limited companies, issue of stock (debentures) payment of cash and stock dividends (not applicable but should be discussed), the issue and method of accounting for and reporting same on financial statements. Accounts receivable is studied in detail including instalment (buying) selling, defaults, repossessions, notes, acceptances, uncollectible accounts and notes, discounting notes and methods of calculating bad debts. Inventory is kept by both periodical and perpetual methods including taking of inventory and methods of pricing. Fixed assets are purchased, classified, depreciated, evaluated, disposed of and traded in. Intangible assets such as patents, copyrights, goodwill are purchased, amortized and recorded. Liabilities are classified and funds raised by issuing, recording, accumulating repayments and finally repaying of bonds.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ACCOUNTING II — CB101

The needs for and nature of accounting principles is stressed including the exact nature of revenue and of expenses and the necessity to match them to determine income. Management use of accounting records is continually stressed. Departmetalization and cost distribution is introduced. The need for cost accounting systems is stressed and specific order, direct labour, perpetual inventories, under absorbed and over absorbed overhead, process costs, historical costs, standard costs, variance analysis, direct costing, incremental costs, alternative costs, replacement costs and future costs are studied. Financial statements are analyzed using ratios, amounts and percents in vertical and horizontal analysis.

A look is take at the changing value of the dollar and management problems of comparison with some of the possible methods of price-level adjustment. The concept of materiality is introduced. The changes in working capital situations and the preparation of source and application of funds, statements and their value to management is looked at. Cash-flow statements are prepared and cash forecasting undertaken. Departmental and branch operations are dealt with. Accounting is looked at as an aid to management and budgeting and profit planning are an important section. A look is taken at income tax.

Wednesday — 7:00 p.m. to 10.00 p.m. 60 hrs. Campus T.

HUMAN RELATIONS I — CB102

The basic theme is that for maximum profit, all persons working in any business must work as a team.

The points under discussion can be listed as:

1. Understanding people
2. Selection and induction
3. Training employees
4. Developing and maintaining morale
5. Elements of wage and salary administration
6. Effective communications
7. Appraising employee performance
8. Discipline and corrective action
9. Understanding the collective agreement
10. Planning and organizing for results
11. Leadership
12. Resistance to change

In most instances the case method will be used to allow the student to "learn by doing" enabling him to study Human Relations in accordance with modern management concepts.

Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PERSONNEL ADMINISTRATION I — CB103

An introduction to the fundamentals of personnel management, including personnel procedures, tools and records, job description, recruiting, interviewing, testing, selection, orientation, training, wage and salary administration, promotion and transfers, benefits and morale.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PURCHASING I — CB104

An intensive investigation and study of the scientific methods involved in buying merchandise from various organizations. Topics studied include: the buying function, the role and services of a resident buyer, the functions of the various bureaus to aid the buyer, the method of merchandise selection, where to buy, how much to buy and how to buy. The importance of planning is studied by investigating the methods of stock planning, the use of merchandise plans, the development of open-to-buy reports and the applications of model stock plans.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BUSINESS MACHINE COURSES

BUSINESS MACHINE SERVICING Part I — C601 (Special)

The aim of this course is to familiarize the student with the operating principles and functions of the various parts of a typewriter and teach him to correct malfunctions that may occur on these machines.

Prerequisite — Grade 10 or some experience in the business machine field.

Course Content — Checking, trouble-shooting, analysing of mechanisms and their operations, corrective adjustments. Assembling and disassembling procedures of the major machine parts.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

BUSINESS MACHINE SERVICING Part II — C602 (Special)

Adding machine servicing — in this course the student will be taught the operating principles and servicing of adding machines.

Prerequisite — Grade 10 or students should be employed in the business machine industry.

Course Content — Theory of adding machines, tape, reading, trouble-shooting, repairing, adjusting. Checking and replacement of parts such as printing mechanism, stop section racks units, power unit and accumulation units.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

SPOKEN JAPANESE — CB60

Course Content — This is an intensive course in oral Japanese. Its first aim is the oral mastery of the basic patterns of verbal interchange needed by a visitor to Japan. Vocabulary and patterns pertinent to situations likely to develop in the context of a visit to Expo '70 will receive particular emphasis. This should free one from being restricted to the well-trodden tourist paths and an absolute dependency on guides.

This course, however, will present a much broader language range than that of mere "phrase-book" interchange. From the very beginning the patterns of speech that will be acquired will hopefully lead to a wider range of oral ability. At a later stage this will allow the student to discuss matters likey to arise in the worlds of international commerce and culture.

The most modern language training techniques will be used involving not only electronic equipment, but far more important, live teaching-learning situations conducted by native speakers of Japanese. These instructors will emphasize the effective oral production of the language in terms of a native speaker. To this end the instructors will use the latest drill, manipulation and spontaneous production techniques in second language pedagogy.

The course will also include lectures designed to familiarize the Canadian with modern Japanese society and culture.

Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus C. Fee $50.00

HOSTESS COURSE — CB61

Prerequisite — A knowledge of the basic methods involved in good preparation.

Course Content — An advanced cooking course designed to give the good cook new ideas and added confidence when cooking for her family and particularly when entertaining.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus C. Fee $50.00.

VARITYPING (Advanced) — CB62

Prerequisite — Previous experience and training on Varityping Machine and 40 words per minute typing.

This course is designed to familiarize the Varityping operator with the advanced techniques of the operation of the Varityper Machine.

Course Content — Automatic justification and its variations, composition of tabular copy with and without leader lines, copyfitting, forms design, ruling by hand, type selection, layout and paste-up.

Tuesday and Thursday — 7.00 p.m to 10.00 p.m. 60 hrs. Campus C.

FURNITURE REPAIR AND REFINISHING — CB63

This course is designed to give the fundamentals of furniture refinishing and minor repairs.

Course Content — Stripping, preparing a wood surface, minor repairs, staining, filling, sealing, and applying various finishes.

Monday and Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus C. Fee $50.00.

DRESSMAKING AND INDUSTRIAL SEWING Part I — CB64

This is a general course in which the aim is to give people a working knowledge of the skills and short cuts, employed in the sewing industry. Class work is designed to develop accuracy, co-ordination, and versatility without sacrificing speed.

Course Content — Basic techniques such as stitching exercises, darts, facings, cuffs, etc. The use of different attachments, the proper method of clipping and trimming, the value of finishing a garment by hand, and applying skills in making aprons.

Tuesday — 7.00 p.m. to. 10.00 p.m. 30 hrs. Campus C.

DRESSMAKING AND INDUSTRIAL SEWING Part II — CB65

Prerequisite — Dressmaking and Industrial Sewing I or equivalent sewing experience.

This is a specialized course that is designed to perfect sewing skills. It is chiefly concerned with the application of general sewing knowledge to the construction of complete garments.

Course Content — Laying out patterns, basting, fitting a garment, zippers, waistbands, setting in sleeves, attaching cuffs and collars, ironing and finishing the garments by hand.

Thursday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus C.

DRESSMAKING PATTERN DRAFTING (Beginners and Advanced) — CB66

Prerequisite — This course is for the student who is knowledgeable in dressmaking.

Course Content — The course includes a systematic method of pattern cutting by drafting directly on paper or on the flat as it is often called.

1. Drafting the basic foundation pattern for your figure type and manufacture size.
2. Emphasis on fitting and alteration of patterns.
3. Understanding the basic principles of the craft, what makes the collar roll a certain way or fit a certain way, what makes a flare, why gathers fall in one direction or another, how the darts are used for fit and for style effects, why the sleeve is comfortable. You will be able to obtain these effects by designing from a sketch or your original ideas.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus C.

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course is a minimum.

ELECTRICAL CONSTRUCTION Part I — CI80 (EL10)

Prerequisite — Grade 10 or the equivalent.

Course Content — Ohm's Law, series circuits, combination circuits, two-wire distribution, line loss, power efficiency, wire calculations, batteries, magnetism, electro-magnetism, induction, three-wire distribution, Hydro Electric Power Commission Regulations, shop projects.

Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL APPRENTICE REVIEW — CI81 (Special)

This is a special course for those apprentices who are in their final term and who expect to write the qualifying examination sometime within the year.

The course will endeavour to cover theory, code and equipment over tbe entire area of apprentice training.

Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL CONSTRUCTION Part II — CI82 (EL20)

Prerequisite — Electrical Construction Part I or the equivalent.

Course Content — electro-magnetism, induction, DC generators, generator set-up and operation, DC motor, motor operation and controls, Hydro Electric Power Commission regulations, shop projects.

Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus A.

ELECTRICAL CONSTRUCTION Part III — CI83 (EL30)

Prerequisite — Electrical Construction Part II or the equivalent.

Course Content — A.C. Fundamental vectors, single phase transformers, three-phase motors, three-phase transformers, auto transformers, Hydro Electric Power Commission regulations, shop projects.

Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ESTIMATING FOR THE ELECTRICAL TRADE — CI84 (Special)

Prerequisite — Journeyman electrician or equivalent.

Course Content — plan analysis, take-off procedure, transferring and pricing, labour units, installation only projects, adjustments for working conditions, cable poles, pull boxes, labour cost variables, non productive labour, incidental and direct job cost, electric heating loads.

Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

HYDRO ELECTRIC POWER COMMISSION REGULATIONS — CI85 (Special)

Prerequisite — Applicants must be at least fourth year apprentices.

Course Content — authority, interpretations, use of the index, application of regulations.

Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INDUSTRIAL ELECTRONIC CONTROLS Part I — CI86 (EL40A)

Prerequisite — Applicants must be fourth year apprentices, journeymen electricians, or maintenance electricians.

Course Content — Review of basic principles, thorough study of AC theory, vector analysis, introduction to electronics and shopwork.

Instruction in this course will consist of 65% theory and 35% shopwork.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INDUSTRIAL ELECTRONIC CONTROLS Part II — CI87 (EL40B)

Prerequisite — Applicants must be fourth year apprentices, journeyman electricians, or maintenance electricians who have successfully completed Part I.

Course Content — types of electronic tubes, amplifiers, tube circuitry and application, phanotrons, thyratrons and shopwork.

Instruction will consist of 40% theory and 60% shopwork.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INDUSTRIAL ELECTRONIC CONTROLS Part III — CI88 (EL40C)

Prerequisite — Industrial Electronic Controls Part II.

Course Content — power supplies, principle of timers, welding timers, current control with gas tubes, thyratron contactors, ignitron contactors, phase shifting, welder heat control, resistance welders, sequence weld timers, synchronous weld timers, shopwork.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INDUSTRIAL ELECTRONIC CONTROLS Part IV — C189 (EL40D)

Prerequisite — Industrial Electronic Controls Part III.
Course Content — photoelectric relays, heat controls, light dimming controls, principle of speed and voltage regulators, speed regulators for small DC motors, voltage control for DC and AC generators, single phase and poly-phase power rectifiers, oscillators, inverters, induction heaters, dielectric heaters, high speed light relays, register control servomechanisms, shopwork.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL DRAFTING & CIRCUITRY I — C190

Prerequisite — A knowledge of basic drafting.
Course Content — Lettering, use of instruments, linework, ortbographic projection, dimensioning, sections, architect scale, isometric projection, sketching.
Electrical and electronic symbols, basic electrical circuit diagrams, transformers, relays, riser and block diagrams, residential wiring, illumination and electric heating.
Text — Electrical Drafting by C. Bishop.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL DRAFTING & CIRCUITRY II — C191 (DR203)

Prerequisite — Electrical Drafting & Circuitry I.
This course is a continuation of Electrical Drafting and Circuitry I and is intended to broaden the student's knowledge of the various types of electrical drawings used in commercial and industrial installations.
Course Content — Introduction and preparation of the main types of electrical drawings including one line, schematic and wiring diagrams used in commercial and industrial installation. Estimating electrical materials from plans. Preparation of electrical job specifications. Wire and cable calculations.
Text — Electrical and Electronic Drawing by C. J. Baer. Publisher — McGraw-Hill.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

LIGHTING FUNDAMENTALS — C192 (Special)

Course Content — The course to begin with nature of light, the eye and relationship between light and sight, lighting terms, laws and control as well as light measurement and meters. A discussion of light sources, its production and characteristics and including incandescent, gaseous discharge and fluorescent lamps. Luminaire data to consist of general, photometric, electrical and mechanical characteristics. Illumination design including zonal-cavity calculations for industrial buildings, offices and schools, store lighting, exterior and residential lighting. Cost analysis to include lamp economics, lighting system ownership and operating costs.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRONIC FUNDAMENTALS Part I — C200 (Combination of Part I and Part II — ELTC 100 & 101)

Course Content — DC theory, electron theory, current flow, magnetism, electromagnestism, motor action, transformers, capacitors, AC theory, resonance, impedance, bandwidth, tubes, diodes, triodes, pentodes.
Lab — suitable series of laboratory experiments correlated to theory.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC FUNDAMENTALS Part II (Radio) — C201

Prerequisite — Successful completion of Electronic Fundamentals Part I or equivalent.
Course Content — Power supplies, audio frequency output stages, detection, intermediate frequency amplifiers, oscillators, converters, RF amplifiers, superheterodyne receivers.
Lab — Suitable series of lab experiments correlated to theory as well as construction and test measurements on superheterodyne receivers.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC FUNDAMENTALS Part III (Television) — C202 (ELTC 102)

Prerequisite — Successful completion of Electronic Fundamentals Part II or the equivalent.
Course Content — Principle of TV transmission and reception, scanning, cathode ray tube, deflection circuits, multivibrator, blocking osc. deflection coils and transformers, damper circuit, high voltage circuits, synchronization circuits.
Lab — suitable series of lab experiments correlated to theory.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC FUNDAMENTALS Part IV (Television) — C203 (ELTC 102B)

Prerequisite — Successful completion of Electronic Fundamentals Part III or equivalent.
Course Content — video amplifiers, picture intermediate frequency amplifiers, alignment of TV intermediate frequency amplifiers, A.G.C. circuits, sound intermediate frequency amplifiers, power supplies, tuners, dynamic test points in TV receivers, trouble shooting.
Lab — suitable series of lab experiments correlated to theory.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

COLOUR TELEVISION — C204 (Special)

Prerequisite — sound knowledge of black and white television circuitry. There will be a short qualifying test at the time of registration.
Course Content — Principles of the colour TV system, colour receiver circuits: RF and IF circuits, video, sync and voltage supply circuits, band pass amplifier colour sync and colour killer circuits, colour demodulation, matrix section, colour picture tube and associated circuits — servicing the colour receiver; set up procedure, aligning the colour receiver, trouble shooting. Current models of receivers will be discussed and demonstrated.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ADVANCED TELEVISION SERVICE TECHNIQUES — C205 (Special)

Prerequisite — Since technicians who successfully complete this course will be accredited by the Electronic Industries Association, applicants must be engaged full time in television servicing. Accordingly there will be a short qualifying test at registration.
Course Content — This course deals with modern TV fault-finding techniques based on increased knowledge of circuit operation and proper use of test equipment.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

TRANSISTORS — C206 (ELTC 103)

Prerequisite — Thorough knowledge of electronic fundamentals and radio receiver circuitry.
Course Content — Introduction to modern electron theory, semi-conductor physics, junction transistors, transistor characteristics, transistor amplifiers, transistor oscillators, transistor radio receivers, transistors in television receivers, transistors in electronic circuits, transistor developments, servicing transistor circuits. Laboratory work will form part of the course .
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

DIGITAL COMPUTER PRINCIPLES — C207 (ELTC 201)

Prerequisite — Electronic Fundamentals II or equivalent and background knowledge of transistor theory.
Course Content — Computer number systems and codes, diode and transistor logic circuits, transistor switching circuits, register circuits, Boolean algebra, arithmetic units, memory systems, input and output devices, the central processing unit.
Laboratory — Logic circuits, transistor flip-flops, counters, shift registers, Boolean logic circuits, the Philco trainer.
Note — An examination at the A.T.E.C. level will be given at the end of the course for those desiring A.T.E.C. credit.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

HIGH FIDELITY TECHNIQUES — C208 (Special)

Prerequisite — Successful completion of Electronic Fundamentals Part I and Part II or equivalent.
Course Content — FM tuners, turntables, cartridge stylus, tone arms, types of motors, pre amplifiers, mono, stereo, power amplifiers, classes of operation, types of distortion, detection and remedy, output transformers, impedance matching, decibel speakers, tape recorders, multiplex.
Lab — Suitable demonstrations and applications of test equipment co-related with course material.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

VIDEO TAPE RECORDERS THEORY AND MAINTENANCE — C209 (Special)

Prerequisite — Fundamental knowledge of Electronics.
Theory magnetic recording, sound waves, electrical waves, electromagnets, tape magnetization, recording process, play back process, scanning systems (properties), single track, multitrack, vertical track, slant (Helical), signal modulation system, operation preemphasis, low pass filter, D.C. restoration, white clipper, limiter, differentiating F.M. signal, de-emphasis, servo-operation.
Maintenance demonstrations of specific tape recorders by company representatives i.e. Sony, Ampex and others as time permits.
Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

The following courses are being offered by The George Brown College under the sponsorship of the Cable Television Association.

CABLE TELEVISION PRACTICE (Basic) — C214 (Special)

Prerequisite — Grade X and Electronics Fundamentals I and II.

1. Introduction to television. Conversion of light to an electric signal. Use of the sync. signal and derivation of composite waveform. Comparison of black and white and colour. Modulation of the RF carrier. Channel allocations. Propagation and antennas. Elements of the receiver and reproduction.
2. Introduction to cable distribution. The basics of antenna site location, system layout, amplifiers, splitters, tap-off devices, subscriber's drops.
3. Co-axial cable characteristics, attenuation, impedance, loop resistance, requirements for impedance matching.
4. Decibels, VSWR, and return loss, and reflections.

5. Amplifiers, general description, tube type, transistorized, wideband, single-channel, main line, distribution and line extender. Power feed arrangements for transistorized amplifiers.
6. Line construction techniques — clearances, safety procedures, cable handling, connector splices, etc.
7. Tap-offs, and subscriber's drop and apartment house wiring.
8. Installation of amplifier housings, amplifiers and passive devices.
9. Service calls and customer relations.
10. Introduction to fault-finding using field strength meter and test TV set.
11. Fault diagnosis — adjacent channel and co-channel interference, cross-modulation, ghosts and noise.
12. Transistorized equipment and cable powering — basic do's and don'ts.

Monday & Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. 2 nights per week. Campus T.

CABLE TELEVISION PRACTICE (Advanced) — C215 (Special)

Prerequisite — Basic Cable Television Practise or recommendation of employer.

1. Review of the television system from transmitter to receiver, modulation, demodulation, waveforms, propagation, reception.
2. Co-axial cable characteristics, decibels, VSWR, impedance matching.
3. Amplifiers, types and application.
4. System design, cascading, noise, intermodulation, levels, equalisation, AGC, etc.
5. System layout, mapping, liaison with utilities, etc.
6. System construction, cable acceptance, set-up and testing.
7. Tube amplifiers — single channel, tuned broadband, distributed line, with explanations of typical circuits in detail.
8. Basic transistor theory and application to typical amplifiers.
9. Amplifier alignment procedure.
10. Head-end equipment — antennas, pre-amplifiers, channel commanders, converters, modulators and F.M. equipment.
11. Subscriber's taps — pros and cons of various methods.
12. Review of cable construction techniques, including underground distribution.
13. System testing and maintenance including use of sweep and marker generator, detector and scope, pads and delay lines.
14. Noise — determining signal to noise ratio of system and measuring noise figures.
15. Intermodulation distortion — causes and measurement techiques.
16. Line testing and fault finding including system radiation, interference originating at antennas and use of new techniques including TDR and spectrum analyser.

Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. 2 nights per week Campus T.

ELECTRIC MOTOR REPAIR — Part I — C700 (Special)

Introduction to D.C. Motor Repair Theory and Shopwork.
Prerequisite — Grade X.
Course Content — Kinds of Electricity — series and parallel circuits — units of electricity — magnestism and magnetic fields — Use of meters and test equipment — drop testing — operating principles of series, shunt and compound motors — conversion to D.C. generators. During the course, students will build a motor, including the field and armature winding.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ELECTRIC MOTOR REPAIR — Part II — C701 (Special)

Theory and Shopwork Single Phase Motors.
Prerequisite — Grade X.
Course Content — A study of various types of single phase motors — starting mechanisms — fault finding — rewinding methods — assembling — testing and test equipment.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ELECTRIC MOTOR REPAIR — Part III — C702 (Special)

Three Phase Motor.
Prerequisite — Courses I or II, or appropriate work experience.
Course Content — Electrical calculations — star and delta connections and comparisons — types of motors — rewinding — testing — use of meters and test equipment.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ENGINEERING TECHNOLOGY

Prerequisites — Candidates should be advised that many of the courses require considerable related experience. The prerequisites for any given course are a minimum.

MECHANICAL MAINTENANCE — C162 (Special)

Prerequisite — This course is designed for those working as maintenance mechanics who have a sound knowledge of hand tools and wish to improve their skills in the operation of the lathe and their knowledge of materials.
Course Content — Properties of iron and steel, heat treatment of steel, case hardening, non-ferrous metals, metal cutting, rake and clearance for hand and lathe tools, cutting speeds, tool grinding, lathe construction and operation, lathe tools and attachments, use of lathe for machine repair operations, resurfacing shafts, shop projects.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

INSTRUMENTATION — C403

Prerequisite — Applicant should be employed in Instrumentation or an associated field.
Course Content — Applied physics, pneumatic and electronic instruments, control theory and systems application, final control elements including valve sizing. Analysis equipment including speed, pH, humidity, chromatography etc.
Text to be announced.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

BASIC INSTRUMENTATION ELECTRONICS — C404

This course is designed primarily for pneumatic instrumentation personnel who wish to study the basic fundamentals of electronic instrumentation. The course consists of lectures, experiments and practical applications.
Course Content — Ohm's Law, series and parallel circuits, test instruments, basic electron tube and transistor theory, thermocouples, potentiometric devices, wheatstone bridge, radiation and optical pyrometry, calibration and troubleshooting techniques.
Text to be announced.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

INSTRUMENTATION TEST PROCEDURES — C405

Prerequisite — Two years industrial experience.
Course Content — Calibration procedures, test equipment, control loop troubleshooting, applications, preventative maintenance procedures. This course consists of a minimum number of lectures. The emphasis is on laboratory practice.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

MODEL-MAKING — C450

Model-making is not only used as a personal hobby but is used more and more in modern industry. Models are made, for example, by the automotive manufacturers prior to the production of a new car. The Aircraft Industry uses models as a cheap and safe way of testing new designs. Most of the aeronautical pioneers were model-makers before they were airplane builders.
Model-making combines many skills which are easily acquired by the average person. In this course these skills are developed as the participant is guided through the construction of various models from the simplest to the more complex.
Planning the model, selection, preparation and use of materials, hand and power tools, reading blueprints, sketching, drawing and design, construction and finishing models.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

NOTE:

Candidates should be advised that many of the following Welding courses require considerable welding experience.
The prerequisite for any given course is a minimum requirement. The College cannot assume responsibility for the failure of a student who registers for a course for which he has less than the stated prerequisites.

WELDING I — C500 (Special)

This is a general course designed to teach the fundamentals of oxy-acetylene and electric arc welding.
Prerequisite — Ability to understand English well enough to absorb instruction.
Course Content — Basic principles of oxy-acetylene and electric arc welding, safety precautions, types and uses of various oxy-acetylene flames, types and uses of various rods and electrodes, braze welding, use of fluxes, explanation of arc welding machine controls, practice welding in the flat position using oxy-acetylene and electric arc equipment.
Choice of Tuesday or Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

WELDING II — C501 (Special)
This is a general course designed to supplement Welding I.
Prerequisite — Successful completion of Welding I or equivalent experience.
Course Content — Theory of alternating and direct current, polarity, arc blow, shielded arc electrodes, classification, colour markings and selection of electrodes, edge preparations, joint design, weld faults, manufacture and storage of oxygen and acetylene, basic welding metallurgy, control of distortion, testing of welds, practice welding in all positions using oxy-acetylene and electric arc equipment.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

WELDING PRE-CERTIFICATION "A" (C.W.B.) — C502 (Special)
This is a course designed to improve the technical skills of candidates who are preparing to take the Canadian Welding Bureau all position metallic arc qualification test.
Prerequisite — Successful completion of Welding I and Welding II or equivalent experience.
Course Content — Safety precautions, function of electrode coatings, electrode selection and application, edge preparation, weld faults, welding techniques, setting up of equipment, testing of welds and operators, codes, practice welding of fillet and butt joints in all positions using cellulose and low hydrogen electrodes.
Note: The College is *not* authorized to issue qualification cards on behalf of the Canadian Welding Bureau. A certificate from The George Brown College will be issued upon successful completion of this program.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

WELDING PRE-CERTIFICATION "B" (Department of Labour) — C503 (Special)
This is a course designed to improve the technical skills of candidates who are preparing to take the Department of Lahour all position metallic arc qualification test.
Prerequisite — Successful completion of Welding I and Welding II or equivalent experience.
Course Content — Safety precautions, function of electrode coatings, electrode selection and application, edge preparation, weld faults, welding techniques, setting up of equipment, testing of welds and operators, codes, practice welding of butt joints in all positions using cellulose and low hydrogen electrodes. Root and face guided bend test specimens will be taken from butt welds in all positions.
Note: The College is *not* authorized to issue qualification cards on behalf of the Department of Labour. A certificate from The George Brown College will be issued upon successful completion of this program.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

PIPE WELDING "A" — UPHILL ARC WELDING — C504 (Special)
This is a course designed to teach the fundamentals of the uphill method of pipe welding using arc welding equipment and low hydrogen arc welding electrodes.
Prerequisite — (1) Successful completion of Welding I and II and Welding pre-certification (A or B).

OR

(2) Department of Labour or Canadian Welding Bureau certification for all positions.
Course Content — Pipe specifications, preparation of pipe, recommended fits and tolerances, electrode selection and classification, testing of welds and operators, codes, practice welding using the uphill welding technique and low hydrogen arc welding electrodes.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

PIPE WELDING "B" — DOWNHILL ARC WELDING — C505 (Special)
This course is designed to teach the fundamentals of the downhill method of pipe welding using arc welding equipment and cellulose arc welding electrodes.
Prerequisite — (1) Successful completion of Welding I and II and Welding pre-certification (A or B).

OR

(2) Department of Labour or Canadian Welding Bureau certification for all positions.
Course Content — Pipe specifications, preparation of pipe, recommended fits and tolerances, electrode selection and classification, testing of welds and operators, codes, practice welding using the downhill welding technique and cellulose arc welding electrodes.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

INERT GAS WELDING (HELIARC) I — C510 (Special)
This is a course designed to teach the fundamentals of manual tungsten inert gas (T.I.G.) and semi-automatic metal inert gas (M.I.G.) welding to persons who are qualified oxy-acetylene or electric arc weldors.
Prerequisite — Successful completion of Welding I and II or a minimum of six months continuous experience in oxy-acetylene or arc welding.
Course Content — Setting up and adjusting T.I.G. and M.I.G. equipment, types, sizes and uses of tungsten electrodes, types and sizes of filler wires, shielding gases, practice welding of mild steel, stainless steel, and aluminum using T.I.G. and M.I.G. equipment.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

INERT GAS WELDING (HELIARC) II — C511 (Special)
This is a course designed as a supplement to Inert Gas Welding I to teach advanced methods and techniques used in manual tungsten inert gas (T.I.G.) and semi-automatic metal inert gas (M.I.G.) welding processes.
Prerequisite — Successful completion of Inert Gas Welding I or equivalent experience.
Course Content — Equipment and power sources used for T.I.G. and M.I.G. processes, wire feed mechanisms, trouble shooting, joint design and preparation, filler wires, testing of welds and operators, codes, practice welding of aluminum and stainless steel tubing, sheet and plate in all positions, incorporating various joint designs and using both T.I.G. and M.I.G. processes, welding of aluminum and carbon steel pipe in all positions using the T.I.G. process.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee — $50.00.

CANADIAN WELDING BUREAU — ALUMINUM WELDING — 515 (Special)
This course is designed to teach the manual and semi-automatic welding of aluminum.
Prerequisite — Applicants must be enrolled in Canadian Welding Bureau Aluminum Welding Correspondence Course.
Course Content — Setting up and operation of manual and semi-automatic equipment, tungstens, shielding gases, welding techniques, filler wires, shop practice using manual and semi-automatic equipment on aluminum.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fees — To be established by C.W.B.

PLATE AND STRUCTURAL LAYOUT — C517 (DR134)
Course Content — Plane geometrical constructions and terminology, orthographic projection, principal and auxiliary views, dimensioning systems, basic principles of descriptive geometry, true length of lines, true shape of planes, true angles, revolutions and intersection of planes, developments by parallel line, radial line and triangulation methods, structural shapes, symbols and specifications, plate sizes and specifications, layout and development of industrial projects involving plate and structural shapes, fabricating methods, shop notes and bills of material.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

BLUEPRINT READING FOR THE WELDING TRADE — C519 (DR147)
Course Content — Orthographic three view projection, linework, notes, dimensioning principles, working drawings, drawing to scale, auxiliary views, technical freehand sketching. A study of welded detail and assembly drawings and industrial blueprints, shop notes, small tool operations, fabrication specifications. Welding symbols as specified by the Canadian Welding Society. Structural shapes and symbols, plate specifications, bills of material, conventional practices, sectional views, blueprint reading methods.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

LATHEWORK — C606 (MACH 141A)
This program is designed for people who wish to acquire basic skills and knowledge in the operation of a lathe. General construction and operation of a standard engine lathe. Theory of lathe cutting tools, sharpening of tool bits, safety precautions, plain turning, knurling, drilling and boring, and counter-boring. Tapping on the lathe, form turning and taper work. Use of various attachments such as face plate, steady and follower rest and grinding.
Tuesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

MILLING AND SHAPING — C608 (MACH 142A)
This program is designed for people who wish to acquire basic skill and knowledge in Milling and Shaping.
Milling machine construction and operation of various types of milling machines, work holding devices, cutters and attachments, speeds, feeds, and safety precautions.
Shaper: Principal parts and operation. Cutting tools, clearance and rake angles. Machining surfaces and keyways with special attention to methods of holding work, safety precautions.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

BENCHWORK — C610 (MACH 140)
This program is designed for people who wish to acquire basic skills and knowledge in benchwork, layout, measurement, drill press, bandsaw, and basic heat treatment. The use and care of band tools such as hammers, files, hacksaws, and scribers, the application and care of precision instruments, including micrometers, vernier calipers and indicators. Layout work. General construction and operation of the drill press and bandsaw, safety precautions, methods of holding work on a drill press, drilling, sharpening, cutting lubricants, selecting and welding bandsaw blades, band filing. Forging, basic heat treatment, operation of furnace and quenching medium.
Monday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

LATHEWORK (Advanced) — C612 (MACH 141B)

This program is designed for people who have successfully completed lathework C606 who wish to acquire advance skills in lathe, tracer-lathe, and turret lathe.
Taper turning, screw threading cutting, single and multiple start, eccentric turning, spring winding. The construction and operation of the tracer and turret lathe. Tools set-up; speeds and feeds, cutting lubricants.
Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

MILLING AND SHAPING — C614 (MACH 142B)

This program is designed for people who have successfully completed Milling and Shaping (C608) who wish to acquire advanced skills and knowledge in Milling and Shaping.
Theory of, and practise in, the use of dividing head, with special attention to direct, plain, differential and angular indexing gear theory, gear cutting, helical milling theory with special emphasis to mathematical problems in helical milling.
Shaping: Theory and practical work in special angles and dovetails.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

GRINDING — C615 (MACH 143)

This course is designed for people who wish to acquire basic skills and knowledge in precision grinding.
Surface Grinding: Construction and operation, mounting wheels, methods of holding work, principles of magnetic chuck, demagnetizing, grinding work square. Use of sine-chuck for grinding accurate angles, safety precautions. Cylindrical grinder, principal parts and operation, internal and external grinding, parallel and taper grinding.
Tool and Cutter: Purpose, theory and practise in sharpening various cutters.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

HEAT TREATMENT OF STEEL — C616 (Special)

Steelmaking processes, carbon and alloy steels, common elements. Properties and uses of structural and tool steels.
Properties of iron and iron/carbon alloys. Phase diagram.
Annealing, normalizing, case hardening, carburizing, surface hardening, tempering, special treatments, hardenability. Furnaces and salt baths, quenching media and methods, atmospheres and flue gases, temperature measurement and control. Design/heat treatment relationships. Non-destructive testing and inspection.
Wednesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

PLASTICS THEORY & TECHNIQUES

Prerequisite — Grade X or suitable experience in plastics industry.
Courses are offered to persons employed in the plastics industry and to those who may be interested in the use of and application of plastics materials, processes and design in hobbies and art.
Information regarding credit and non-credit courses may be obtained from the Registrar, 37 Dartnell Avenue.

Materials:

History, Properties — End Uses — Methods of manufacture — Processes.
(a) Engineering Thermoplastics: Acrylics, acetals, nylons and polycarbonates.
(b) Engineering Thermostats: Polyesters, phenolics and epoxies.
(c) Ingredients and reinforcements.
(d) Properties: Plastic characterization and identification, physical, mechanical, electrical, thermal, optical and environmental properties.

Processes:

Theory of processes: Machine design, Machine operation and set-up. Advantages and Limitations.
(a) Thermoplastic process: Processes, general. Extrusion. Blow moulding. Injection moulding. Thermoforming. Calendering.
(b) Thermoset processes: Process, general. Low pressure. Compression. Injection. Filament winding.
(c) Forming and Fabricating: Materials. Machining. Assembling. Tooling. Jigs and fixtures.
(d) Process equipment: Design and operation. Hydraulics. Heat transfer. Electricity and mechanics.
(e) Product testing: Industry standards, ASTM systems. Specifications.

Design:

(a) Product design.
(b) Mould manufacture and mould materials.

Related Subjects:

(a) Polymer chemistry: Elements, compounds and mixtures. The atom. Simple organic compounds. Polymers. Composites.
(b) Plastics applied sciences: Electrics. Hydraulics. Mechanics. Rheology.

(c) Engineering Mathematics: Algebra. Logarithms. Trigonometry. Computer mathematics. Elementary statistics.
(d) Communications: Business correspondence. Reports — preparation and presentation. Public speaking and debating. Research — technical material resources. Contemporary authors.
(e) Industrial Management: Budgeting. Management of physical property. Plant organization, Production control. Cost control — process economics. Selling and merchandising.
(f) Blueprint reading.
"THERMOSETS" Tuesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus B.
"THERMOPLASTICS" Wednesday & Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

PRODUCTION AND INVENTORY CONTROL I

This course is offered in co-operation with the Canadian Association for Production and Inventory Control. The objectives of the course are:
(a) to acquaint those who have recently entered this field with the fundamental techniques being applied in this area of management;
(h) to emphasize the practical application of techniques that have proven successful in a number of companies representing a wide cross section of industry;
(c) to offer an insight into this field for supervisors engaged in areas of management related to production and inventory control.
The lecturers are practitioners or consultants in production and inventory control. Each session will centre around participation by those enrolled in the course. Registration will be limited to encourage discussion among the students and with the instructor at each session. Additional experts will be called upon to assist in the lecturing.

Production Control:

Introduction to production and inventory — What is expected of production control — Quotas, forecasts and budgets — Long range planning — Short range planning — Processing the production order — Control techniques — Cycle time control — Case study — Reporting and follow-up — Data processing and production control.

Inventory Control:

Principles and functions of inventory control — Identification and classification — Stock records cards and their use — Control of inventory, policy — Re-ordering systems — Case study exercise — Practical applications — Data processing and inventory control — Summation and test — What management requires of an inventory control system.
Tuesday — 7.15 p.m. to 9.45 p.m.70 hrs. Campus D.
Fee — $60.00.

INTRODUCTION TO QUALITY CONTROL I — C617

Course Content — History of Quality Control, terminology, need for Quality Control. Quality of design and conformance, total Quality Control. Tools and techniques, statistics, communications testing and inspection. Design review, cost analysis and auditing, tool and gauge control. Field and shop complaints, standards, scrap and rework data.
Monday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

INTRODUCTION TO STATISTICAL QUALITY CONTROL II — C618

Course Content — Variability and frequency distributions, normal distribution, probability, graphical frequency distribution analysis, control charts, acceptance sampling.
Monday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus D.

STATISTICAL METHODS IN QUALITY CONTROL — C619

Prerequisite — Introduction to Statistical Quality Control II.
Course Content — Review of variability and normal distribution, normal curve, probability, test of hypothesis of the mean. Point and interval estimates of the mean, inferences about variances, sample size determination. Acceptance sampling, control charts, analysis of variance, individual effects, regression and correlation, non-parametric methods.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

QUALITY CONTROL MANAGEMENT AND PRINCIPLES — C620

Course Content — Principles of basic management, the quality policy, jobs of quality control, the quality system, quality costs, organizing for quality control, quality motivation and training, pre-production quality review, pre-production quality planning, incoming material quality planning and control, product and process control, quality information equipment, post production quality service, special quality studies.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

FOOD TECHNOLOGY

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

PRACTICAL BAKING — C800 (BAK 10-1A)

This course is designed for anyone wishing to acquire a basic knowledge of baking. Special emphasis will be placed on variations, quality and eye appeal.
Course Content — Breads, pastries, cakes, French pastries, puff pastries and pate aux choux — pre-mixes and other convenience products. Course will include demonstrations and student participation.

Monday — 7.00 p.m. to 10.00 p.m. Instructor J. Polak, Baking Laboratory. 60 hrs. Campus N.

STRICTLY FOR GOURMETS — C806 (CHEF 10-1B)

A program of twenty lectures/demonstrations based on the classical recipes of France's Haute Cuisine. This is not a course for beginners but rather a course designed for both men and women who have a sound knowledge of the classical methods of food preparation and service who wish to pursue their avocation to a higher degree of excellence.
Students of Haute Cuisine will be expected to participate in this program by demonstrating their forte to the group wherever possible. Suitable wines will be offered for tasting along with each dish presented.
The program content will be determined on a weekly basis according to the interest and ability of the students enrolled.
Texts — Chez Maxims Gourmets Cookbook — Basic French. Subscription to Gourmet Magazine.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.
Fee $50.00 — Lab. fee extra — Minimum enrolment 20 students.

PRACTICAL COOKING COMMERCIAL I — C807 (CHEF 10-1A)

Prerequisite — This course is offered to those persons who have a basic knowledge of cooking. Lectures, demonstrations and student participation are designed to teach practical cooking with a difference. Emphasis will be placed on variations of taste and texture in normal everyday foods, keeping in mind accurate costing and portion control.
Course Content — Basic soups and sauces, roasting, broiling and baking of meats, poultry cookery, roasting, sauteing, casseroles, various methods of preparing and cooking fish with accompanying sauces and garnishes, salad preparation with suitable dressings, use of fresh fruit and vegetables, vegetable cookery, egg cookery, sandwich preparation.

Tuesday — 7.00 p.m. to 10.00 p.m. Instructor K. Sawodny, Food Technology Laboratory. 60 hrs. Campus N.

STRICTLY FOR THE HOMEMAKERS — C808 (Special)

Prerequisites — This course is offered to those persons who desire to obtain a thorough knowledge of practical cooking. Lectures, demonstrations and student participation designed to teach practical cooking based on classical French cuisine.
Course Content — Basic stocks, sauces and derivatives, soups, methods of cooking meat, poultry, fish and game by sauteing, broiling, roasting, poaching and boiling, braising and stewing, deep frying, etc. Shellfish, variety meats, etc. Stuffings and fillings. Vegetables and methods of cooking same. Salads and suitable dressings, egg cookery. Introduction to pastries, breads, and various desserts.

Monday — 7.00 p.m. to 10.00 p.m. G. Bourbeau, Food Technology Laboratory. 60 hrs. Campus N. Fee $50.00.

STRICTLY FOR NEW CANADIANS — C809

This course is designed to introduce new Canadian homemakers to the basic principles of Canadian cooking.
Course Content — Use of large and small electric appliances, introduction to nutrition for the family, effective meal planning, effective buying. Basic principles and techniques of food selection, combination, and cooking, table settings and service.
Note: This course is offered in conjunction with the Toronto Y.W.C.A. on a ten-week interval commencing the first Wednesday in October of each year. Please contact your local Y.W.C.A. for confirmed starting dates of the Director of Extension Courses, George Brown College.

Wednesday — 1.00 p.m. to 4.00 p.m. 30 hrs. Campus N.
Fee $26.00.

STRICTLY FOR ENTERTAINMENT — C810

A series of lecture/demonstrations designed for those homemakers having a basic knowledge of cooking but wish to entertain at home with flair and imagination. Although the meals prepared are not intended to represent the economical fare for the family, the basic principles of the selection, combination and cooking of food can be applied to everyday use.
Each session will be devoted to a complete menu and students will be given the opportunity

to taste each dish whenever possible. A selection of complimentary wines will be discussed and sampled.

Two Courses — Monday — 1.00 p.m. to 4.00 p.m. and 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N.
Instructor Miss Anne Wanstall — Fee $30.00.
Note: Additional programs will be offered by Miss Wanstall throughout the school year.

SMALL BAKERY MANAGEMENT — C811

This course is designed for persons wishing to upgrade their positions and for those already in management positions who wish to broaden their knowledge into other areas of the baking industry.
Course Content — Stock control, costing principles, production scheduling, government regulations and law, labour utilization, human relations, work study, job specification, product development, new production techniques.

Thursday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N
Instructor: Miss G. Jenkins, F.Inst. B.B.

WINE MAKING FOR THE AMATEUR — C812

This course is designed for those persons interested in the art and craft of making wines at home and is open to any person over the age of twenty-one.
Course Content — Brief history of wine making, basic wine making equipment, yeast and yeast cultures, stages in wine making, basic methods of testing analysis and evaluation. Students will be given the opportunity to participate in all stages of the program including making various types of wines, conducting tests and taste evaluation of both homemade and commercial wines.

Thursday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N.
Fee $26.00 plus ingredients. Instructor A. Marshall Tech. Lab.

BEVERAGE SALES AND SERVICE (Cocktail Bartending) — C813

A basic course for cocktail bartending. This course is open to men or women twenty-one years of age and who are currently working full or part time in a licensed establishment.
Course Content — Bar layout and equipment, manufacture of alcoholic beverages, beverage selection, storage and control. Duties of the bartender, pre-opening preparation, theory of mixed drinks, practical preparation of mixed drinks and cocktails, sales and service of alcoholic beverages, selection of wines and their service. Human relations relating to licensed establishments.

Monday — 1.00 p.m. to 4.00 p.m. 30 hrs. (full course) Campus N. Dining Room.
Tuesday — 7.00 p.m. to 10.00 p.m. 30 hrs. (full course) Campus N. Dining Room.
Fee $35.00 (Non-refundable).

STRICTLY FOR THE BUDGET MINDED — C814
(Cooking on a Shoestring)

This course is designed to help the harassed homemaker to plan and execute an excellent and diversified diet for all the family members within a pre-established budget. We will draw on the culinary wealth and tradition of most nationalities, always mindful of the cost.
Course Content — Cereals, soups, casseroles, braised meats, the use of nourishing by-products, how to glamourize left-overs. Taking advantage of seasonable bargains. Covering the whole spectrum of formal and informal entertaining.

Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N.
Instructor: Hans Freed. Fee $26.00.

EXTRA SHORT — EXTRA SPECIALS — C815

The series of demonstrations and lectures which make up the outline of this course give an opportunity for those employed in the baking industry to broaden their knowledge in special areas. Although it is hoped that interested persons will complete the whole course, this will not be necessary. Registration for one or more subjects will be permitted.

	Course Content
1969	
Sept. 11 - 25	Variety bread, including cheese, tomato and germ.
Oct. 2 - 16	Bread rolls in variety
Oct. 23 - Nov. 6	Fancy fermented goods, sweet goods, and Danish pastries.
Nov. 13 - 27	French pastries.
Dec. 4 - 18	Pies, all varieties including meat pies.
1970	
Jan. 8 - 22	Large cakes in variety.
Jan. 29 - Feb. 12	Small cakes in variety.
Feb. 19 - March 5	Cookies and petits fours.
March 12 - 26	Preparation and use of pre-mixes.
April 2 - 16	Decorating with different creams and icings.

Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus N. Bakery Lab.
Fee $40.00 or $5.00 per grouping, Instructor S. Jenkins, F.Inst. B.B.

CAKE DECORATION AND DESIGN I — C816 (BAK 10-1C)

This course is designed for those persons who wish to learn the art of cake decoration and design.

Course Content — Icings and coatings, royal icing, fondants, butter creams, couvertures, boiled icing and frostings, basic design, techniques of piping, decorating materials, methods, freehand, geometric designs, stencils, run-outs, prefabricated decorations, lettering, flowers, border designs, etc.

Cakes for special occasions — techniques and methods.

Tuesday — 7.00 p.m. to 10.00 p.m. Instructor F. Steel, Baking Laboratory. 60 hrs. Campus N.

RETAIL MEAT STORE MANAGEMENT — C820 (FOOD 140-1B)

This course is designed for persons in positions below that of manager who wish to upgrade their knowledge and any person actively engaged in small meat store operation.

Course Content — Financial control of retail meat operation, buying, receiving, storing, art of displaying, costing, personnel handling, advertising, customer relations and advanced cutting methods for additional profit and variety.

Monday — 7.00 p.m. to 10.00 p.m. Instructor M. Kerman, Meat Laboratory 60 hrs. Campus N.

RETAIL MEAT CUTTING — C821 (FOOD 140-1A)

This course is designed for persons in junior positions in the retail meat trade and persons interested in the skill of meat cutting.

Course Content — Cutting, grading and characteristics of beef, pork, lamb and veal carcasses. Preparation of poultry, fish and shellfish for retail sale, preparation and use of various animal organs, displaying and merchandising of all types of meat products.

Tuesday — 7.00 p.m. to 10.00 p.m. Instructor M. Kerman. Meat Laboratory 60 hrs. Campus N.

AN EDUCATION IN MEAT BUYING FOR THE HOUSEWIFE — C822

A program of ten lectures and practical demonstrations that will familiarize the housewife on the best way to get the most value for her meat dollar.

Course Content — Degrees of tenderness of meat muscle, know your meat by sight, know its limits as far as basic cooking, beef, pork, lamb and poultry covered extensively. Evaluation of newspaper advertised specials.

Wednesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N, Instructor Mr. A. Buck. Fee $26.00.

MENU PLANNING FOR FOOD SERVICE ESTABLISHMENTS — C823

Prerequisite — Previous supervisory experience in food industry is desirable.

Course Content — Food habits and meal patterns, the "classical" or formal meat pattern, principles of planning a well balanced mea, use of descriptive terminology on the menu, "classical" (i.e. French) menu terminology, rational use of food supplies in menu planning, advantages of "limited" menus and of cyclical menu planning, planning banquet menus, rational consideration of staff and equipment facilities in menu planning, methods of serving food, costing and pricing the menu.

Monday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N, Instructor K. Richardt.

CONTROL OF FOOD AND LABOUR COSTS IN FOOD SERVICE ESTABLISHMENTS — C824

Prerequisite — Previous supervisory experience in food industry is desirable.

Course Content — Weights and measures, conversion of volume measures of food to weights, developing standard recipes, costing the recipe, standardization of portion sizes, use of the food cost percentage, calculating selling prices, stock control, receiving and issuing control, rational purchasing of food supplies, standard purchasing specifications. Systems of food cost control.

Control of labour costs, establishing man-hour standard labour units, rational scheduling of staff.

Tuesday — 7.00 p.m. to 10.00 p.m. 30 hrs. Campus N, Instructor K. Richardt.

N.B. — A recommended sequence for most benefit is Menu Planning for Food Service Establishments initially followed by Control of Food and Labour Costs in Food Service Establishments.

GRAPHIC ARTS

Prerequisites — Candidates should be advised that many of the following courses require considerable related experience. The prerequisite for any given course is a minimum requirement.

SIGNWRITING — C136 (Special)

This course is designed to give the fundamentals of general signwriting and the hand cut silk-screen process.

Course Content — Basic lettering strokes, alphabets, colour theory and the principles of good layout. Elementary silk-screen process.

Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SCREEN PROCESS — PRINTING — C137 (Special)

This course is designed for persons currently employed in this field who wish to upgrade their skills in the more specialized methods of the photographic process.

Course Content — The operation of the process camera, line and halftone film making. The proto-screening method of silk-screen reproduction. Preparation of direct screen emulsion stencils. The application and procedure to good screen making.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SCREEN PROCESS PRINTING (Basic) — C138

This course is designed for persons not in the industry, but who wish to attain skills in basic stencil cutting, screen making and printing.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PRINTING TECHNOLOGY

Minimum requirements — Grade XII and/or industrial experience in the related field.

C139 — Design, layout, appreciation of typography and preparation of mechanicals for process colour reproduction.

C140 — Hot metal composition. (Monotype, Linotype or Intertype).

C141 — Photo-composition (details to be announced later)
Prerequisite — Extensive experience in hot metal composition.

C142 — Black and White Reproduction.
Line as well as halftone for offset or gravure.

C143 — Process colour reproduction for offset or gravure.
Prerequisite — Professional experience in black and white reproduction.

C144 — Film imposition, colour stripping and printing surface preparation for offset or gravure. Professional experience desirable.

C145 — Machine Printing — One colour and two colour machine operation for offset. Letter press machine operation.

C146 — Binding and Finishing — Re-binding, set-up procedures for folder, stitcher, programmed paper cutter, sewing machine, adhesive binding, creasing, gold stamping, die making and carton making.

C147 — Statistical methods and quality control procedures for printing industry.

Details of the courses are to be printed by the middle of June and will be mailed to the persons inquiring by telephone to the Extension Department, 21 Nassau Street, Telephone 362-3971 Extension 126/7/8.

Classes will be held one night a week from 7.00 p.m. to 10.00 p.m. at 51 Teraulay Street.

MARINE TECHNOLOGY

STATIONARY ENGINEERING 3rd & 4th CLASS — C900

These courses are orientated towards the students successful participation in the Department of Labour's examinations as outlined under the Operating Engineers Act.

Prerequisite — 19 years of age.

Course Content — Steam boilers including safety valves, water gauges and columns blow-down and scum valves, boiler construction, feed water admission treatment and conditioning, safe operation, maintenance and inspection.

Combustion: fuels, fuel burning and firing equipment and air supply.

Auxiliary equipments: feed water heaters, condensers, pumps, injectors and air compressors. Refrigeration systems including safe operation and maintenance. Principles of electricity, operation and maintenance of motors, generators and transformers.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D. (Wed.)

STATIONARY ENGINEER 2nd CLASS — C90I

Prerequisite — 3rd Class.

Course Content — Steam boilers and accessories construction and maintenance with emphasis on operation, repair and inspection and testing; combustion, fuels, heat transfer.

Refrigeration theory, operation, maintenance, repair and inspection. Air compressors, types, principles and safe operation of systems.

Mathematical calculations relating to: boiler performance, fuel combustion, draft, refrigeration performance, boiler construction, electricity and pumps.

Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

ENGINES FOR YACHTSMEN — C902

Prerequisite — Interest in all marine engines.

Course Content — Theory of the 2 and 4 stroke cycle engines. Construction of engine components, their functions and requirements; oil systems, cooling systems, starting motors, pumps and fuel systems.

Timing and adjustment of pump injectors. Thrust bearings and marine gear boxes, engine governors.

Care and maintenance, trouble shooting and winter lay up.

Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

CELESTIAL NAVIGATION FOR YACHTSMEN — C903

Course Content — The Earth-Grid system of co-ordinates, the celestial sphere, celestial position lines, time, the sextant, practical instruction on sight taking, the Nautical Almanac, position fixing by the sun, moon, planets and stars (H.O. 214 method), compass error, star identification.

Tuesday or Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

SMALL BOAT BUILDING, REPAIR, AND MAINTENANCE — C904

Course Content — Introduction to small boat building, materials and tools, safe working methods, type of small boats, layout of component parts, type of construction, practical construction, finishing, surface filling, protective material.

PROPULSION — Types of sails, masts and rigging, fittings, small motors.

Tuesday & Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

CANADIAN POWER SQUADRON COURSES

In addition to the foregoing the College provides accommodation for courses offered by the Toronto Power Squadron. Registration for these courses will take place on Monday, September 23rd, from 7.30 p.m. to 9.30 p.m. at 37 Dartnell Avenue. Classes begin during the week of September 30th, with the exception of courses marked *, which begin one week later. All courses will end on the date set by the examination board, which will be announced. Further information may be obtained by telephoning the Toronto Power Squadron at: RU. 1-0005.

The courses offered are listed below. All classes Campus D.

PILOTING — $30.00. Available both Monday and Wednesday. Terminology — Equipment — Government regulations — Rules of the road at sea — Safety at sea — Mariner's compass — Aids of navigation — Charts and piloting — Manners and customs on board. Successful completion of this course qualifies a person for membership in Canadian Power Squadrons and admission to other courses. Membership is open to men, women and juniors (Under 18).

THE FOLLOWING ADVANCED COURSES ARE OPEN TO MEMBERS OF CANADIAN POWER SQUADRON

* SEAMANSHIP — $10.00. Handling small craft, both power and sail, marlinspike, elementary weather, adverse conditions, gear and equipment, problems.
  Tuesday

* ADVANCED PILOTING — $10.00. Advanced chartwork and methods of determining position. Leeway allowances, tides and currents. Elementary radio aids to navigation.
  Wednesday
* ENGINE MAINTENANCE — $10.00. Operating principles of marine engines, inboard and outboard. Electrical, fuel, lubrication and cooling systems. This course is designed to make boatmen more self-reliant, not to train engine mechanics.
  Monday
* MARINE ELECTRONICS — $10.00. Marine radio maintenance and communication procedures. Radio direction finding, radar, Loran and Consolan. Electronic marine aids and equipment. The course includes the requirements of the D.O.T. examination for the Restricted Radiotelephone Operator's license.
  Monday
* SAILING — $12.50. Terminology, rigging, points of sail, true and apparent wind, theory of sail action, bending, setting and care of sails. Some aspects of racing are also covered.
  Tuesday
* WEATHER — $10.00. The atmosphere, air masses, wind systems, causes of weather, observing and interpreting weather signs, elementary forecasting. The emphasis of this course is on short range forecasting for small boats at sea.
  Tuesday
* JUNIOR NAVIGATOR — $25.00. Open only to successful candidates in both Seamanship and Advanced Piloting. Introduction to deep-sea navigation using celestial techniques. Care and use of the sextant. Reduction of star sights to determine position. Elementary time, the sailings and pilot charts.
  Tuesday
* NAVIGATOR — $25.00. Open only to successful candidates in Junior Navigator. Coordinate systems, navigational astronomy, civil, solar and sidereal time, star identification, refined methods of sight reduction.
  Monday

Note: All course fees are subject to confirmation.

SPECIAL COURSES IN SUPERVISION

We are offering the following courses to people who are now employed in the supervisory field or are to be considered for employment in this area.
These courses will be held one night a week in all cases for a period of ten weeks and can be offered at the school or company premises whichever is more convenient for persons interested in taking the courses.

EFFECTIVE SUPERVISION — PRODUCTION — SI00

This course is designed to help the Supervisor and Foreman to increase productivity of their organization in areas within their control, as well as to contribute to such improvements in other areas.
It covers a broad segment of industrial supervision presenting both the philosophy and elementary technology which have proved successful with a great number of industries. The four specific objectives are to: identify the supervisor's function, reduce the waste of human, material and financial resources, reduce basic work and material content and improve the motivational climate of the organization.
The ten-sessions (each of approximately two hours duration) are:
The Role of the Supervisor — Principles of Effective Supervision — Taking Proper Action — Motivation of the Worker — Setting Objectives and Goals — Planning — Scheduling — Measuring Results and Evaluating Efficiency — Improvements — Getting a Day's Work Done.
The subject matter of each session is developed around a case, each case being typical production problems that the participants are required to resolve with the assistance of an experienced course leader. Supplementary readings are also supplied that provide each participant with a permanent record on the principles of Effective Supervision.
The course will make a positive contribution to the management ability of supervisory personnel in industry and the owner/managers of small companies.
Monday — 7.00 p.m. to 9.00 p.m. 20 hrs. Campus N.

EFFECTIVE SUPERVISION — CONSTRUCTION — SI0I

The construction Supervision course has as its objective the increased effectiveness of the Supervisor and Foreman in a mechanical, electrical or general conracting job.
The course covers the fundamental activities of a manager, including production planning and control techniques which are related to this type of work. These are taught in a series of case studies set in appropriate construction situations. These cases were designed from occurrences in actual practice, and are considered to be unique for this type of course.
While the course outline is practically the same as for the manufacturing course, the instructional material is quite different. Emphasis throughout is on managing a situation where conditions and resources may change from day to day. Also, the fact that construction jobs are usually "one off", as compared with manufacturing where many identical pieces are usually being considered.
In line with modern control techniques, the student is introduced to Critical Path Method, and is taught to use it as an aid to effective project management.
The course is ten sessions in length, each of approximately two hours duration.
Tuesday — 7.00 p.m. to 9.00 p.m. 20 hrs. Campus N.

EFFECTIVE SUPERVISION — ADMINISTRATION — SI02

The object of the course is to improve the ability of the supervisor. It is designed for supervisors in administrative, office, clerical, professional, technical, financial and commercial fields. It will be beneficial to those in both profit-oriented and service industries, in government organizations in small, medium or large enterprises.
The Administrative Supervision course can be taken in place of the Production or Construction Supervision courses.
The ten sessions are:
The Role of the Supervisor — Principles of Effective Supervision — Analyzing the Problem — Setting Objectives and Goals — Organizing and Planning — The Human Factor — Flow of Information — Improvements — Evaluating Operations and Controlling Activities — Managing High Talented Personnel.
In each session the student will apply problem solving techniques to a typical administrative situation.
The material provided includes up-to-date ideas in productivity improvement and systems analysis.
The course is ten sessions in length, each of approximately two hours duration.
Wednesday — 7.00 p.m. to 9.00 p.m. 20 hrs. Campus N.

HUMAN RELATIONS — S103

The objective of this course is to help the supervisor to deal effectively with his problems in the area of personnel management.
Using the case method, the student in effect learns "by doing", and studies Human Relations in accordance with modern management concepts. The cases include a cross-section of incidents in various business concerns; hence they learn to deal with problems in different settings.

The basic theme of the course is that for profit maximization, all persons working in a business must work as a team.
The ten sessions are:
Understanding people — Selection and induction — Training employees — Developing and maintaining morale — Elements of Wage and Salary Administration — Effective Communications — Appraising employee performance — Discipline and corrective action — Understanding the collective agreement — Planning and organizing for results.
Two alternative sessions are available: Leadership — Resistance to Change.
Thursday — 7.00 p.m. to 9.00 p.m. 20 hrs. Campus N.

LABOUR RELATIONS — SI04

This seminar is designed to help the Supervisor and Foreman deal effectively with aspects of labour relations, both where collective agreements have already been established, and where certification may become possible.
The student will study this very important subject by working through a series of "case studies", each case specializing in a particular problem. Various businesses are considered, in order that the class gain experience in a variety of settings.
The course consists of ten sessions (each of approximately two hours duration) entitled:
Employer - Employee - The Relationship — Establishment of Bargaining Rights — Negotiations for a Contract — Content of Collective Agreement — Union Security — Management Rights — Complaints, grievances and Arbitration — Wages, Classification and Benefits — Relationship Arising out of Contracts — Administration of the Collective Agreement.
In addition to the above material, excellent supplementary readings are provided, which will form a permanent manual on Labour Relations.
This seminar will strengthen the supervisor's abilities in an area where quite often too little attention has been given.

All Supervisory courses are at $30.00 per subject per person. Available in the George Brown College instruction rooms or at pre-arranged areas throughout the city.
Monday — 7.00 p.m. to 9.00 p.m. 20 hrs. Campus N.

CREDIT SUBJECTS FOR CANADIAN INSTITUTE OF QUANTITY SURVEYORS 1969—1970

1. ELEMENTARY BOOKKEEPING — No G.B.C. equivalent

Course Content — Starting a bookkeeping system, recording the opening entry in a journal, posting the opening entry, recording changes in asset and liability accounts, recording income and expenses, posting, proving the accuracy of posting, the six-column work sheet, the profit and loss statement and the balance sheet, closing the ledger, recording the buying of merchandise on account, recording cash payments, recording the selling of merchandise on account, recording cash receipts, the general journal, bank deposits and reconciliation of bank statement, work sheet with adjustments, financial reports, adjusting and closing entries.
Textbook — 20th Century Bookkeeping and Accounting. By: Carlson Forkner, Boylton & Taylor. Publisher: W. J. Gage Ltd., Toronto, Ontario.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

2. ECONOMICS (Outline of Economics) — CT102 (EC100)

Course Content — Basic economic problems, supply and demand, business units, personal finances, money and banking, labour, international trade, business cycles and national accounts, social services.
Textbooks — Understanding the Canadian Economy. By: W. Trimble. Publisher: Copp Clark Publishing Company (1957).
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

3. SURVEYING Part I (Surveying and Levelling) — C156 (SURV 101)

Course Content — Fundamental principles of surveying, levelling, chaining, use of the transit, bearing and azimuths, field notes, transit surveying, latitudes and departures, calculation of missing courses, calculation of areas D.M.D.'s earthwork computations, introduction to curves.
Textbook — Simplified Site Engineering. By: Parker, Gay and MacGuire. Publisher: John Wiley & Sons Inc.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

4. CONSTRUCTION METHODS AND MATERIALS (Building Construction I) C154 (CB103)

Course Content — Brick material, masonry, bricks, tiles, etc., doors and windows, light wood framing, foundations, excavation and waterproofing.
Textbook — Materials and Methods of Architectural Construction. By: Parker, Gay and MacGuire. Publisher: John Wiley & Sons Inc.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

5. STRUCTURAL STEEL DESIGN AND DETAILING Part I (Basic Design) C160 (CIV200A)

Course Content — Force systems, force analysis of structures, stress and strain, shear and moment in beams, design of simply supported beams — structural steel, plain material, fabrication, bolted and welded connections.
Textbooks — Structural Steel Detailing/AISC Mechanics of Materials. By: I. J. Levinson. Publisher: Prentice-Hall.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

6. QUANTITY SURVEYING (Part I) AND BUILDING CONSTRUCTION ESTIMATING (Quantities Part I) — C153 (CO101)

Course Content — Mathematics related to take off and estimating, General methods and procedures of taking off quantities for excavation, site work, concrete formwork and masonry.
Textbooks — Method of Measurement of Construction Works (1st) Publisher: Canadian Institute of Quantity Surveyors.
— Construction Estimates from Take-Off to Bid. By: Norman Foster.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

7. BUILDING CONSTRUCTION Part II — C159

Prerequisite — Building Construction Part I and Basic Design.
Course Content — General history of building construction, stonework, metal doors and windows, exterior and interior trim, brick and stone construction, heavy timber construction.
Textbook — Materials and Methods of Architectural Construction. By: Parker, Gay and MacGuire, 3rd Edition, April 1958. Publisher: John Wiley & Sons Inc.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

8. ARCHITECTURAL DRAFTING Part I (Drafting) — C150 (DR102)

Course Content — Drafting equipment and procedure. Canadian symbols and conventions. Foundation and floor plans for various types of construction, site plans, typical wall section, window details, door details, lathing and plastering details, stair details, fireplace and chimney details, simple structural steel and reinforced concrete details, freehand sketches.
Textbooks — Architectural Drawing and Light Construction. By: Muller. Publisher: McGraw-Hill Publishing Co.
Architectural Drawing Standards, No. 33GP7. By: National Research Council. Publisher: Queen's Printer, Ottawa.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

9. REINFORCED CONCRETE DESIGN (Structural Steel and Reinforced Concrete) C155

Course Content — Principles of mechanics, forces, stresses, moments and reactions, shear and bending moments, theory of bending and properties of section. Concrete — manufacture of cement, properties and use of aggregates and additives and placement of concrete. Reinforcing — reinforcing bars, bending and bending schedules and reinforcing bar placement. Reinforced concrete design — stresses in reinforced concrete.
Modulus of elasticity: Design formulas for beams, diagonal tension and web reinforcement, Bond, design of rectangular reinforced concrete beams, alternate design, web reinforcement for girders, design of T-beams, one-way solid slabs, load tables, design of ribbed slabs, design of stair slabs, design of tied columns, design of spiral columns, design of wall footings, design of independent footings.
National Building Code — Interpretation — Application.
Reference Book — Simplified Design of Reinforced Concrete. By: Parker, Gay & MacGuire. Publisher: John Wiley & Sons Inc.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

10. PLUMBING, HEATING & FIRE PROTECTION — C320

Course Content — Properties of water, well and booster pumps, municipal water treatment, control valves, hot and cold water supply, drainage designs, stacks, waste and vents, municipal and private sewage treatment, fire line installations.
Fuels and consumption, boilers, furnaces, chimneys, heat distribution, hot water heating (including radiant) radiators, convectors, installation and testing, steam generation, steam systems, vacuum systems, zoning.
Environmental comfort, heat loss and gain, warm air perimeter heating, furnaces, ducts, dampers, registers, controls. Nature of electric heating, thermal design, methods and equipment.
Textbook — Mechanical & Electrical Equipment for Buildings. By: McGuiness, Stein, Gay & Fawcett. Publisher: John Wiley & Sons, New York, N.Y.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

11. ELECTRICAL, AIR CONDITIONING & VENTILATING — C193

This course shall consist of various electrical topics related to the architectural features of construction and design as described below.
Light, including its sources, laws, characteristics and measurements. Electricity and electrical circuits including H.E.P.C. regulations and electrical wiring design and layouts. Materials used as conductors and insulators in electrical machines. Sound and signal equipment and installations consisting of various alarm and communication systems.
Textbook — Mechanical and Electrical Equipment for Builders (Fourth Edition) Chapters 19 to 24. By: McGuinness, Stein, Gay & Fawcett. Publisher: John Wiley & Sons Inc. New York.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

12. QUANTITIES Part II — C165

Course Content — This course is essentially an extension of Quantities Part I. This extended scope with the additional areas of knowledge required for this subject incorporated will include Site Work, and Excavation, including excavation for underpinning, rock excavation and shoring and sheeting excavations, Concrete and Formwork, including special floor treatments, specially shaped roofs, domes, arches, precast concrete members, specialized architectural treatments of concrete and pre-stressed concrete reinforced steel, Masonry (Brick, concrete, cut stone, fieldstone and related items), carpentry (rough carpentry, finished carpentry), and application of the principles previously learned to measurement and quantity take-off related to more difficult and complex buildings, multi-storey or high-rise buildings and reinforced concrete or steel framed buildings and structures and alteration work.
Reference Books — Construction Estimates from Take-Off to Bid. By: Norman Foster. Publisher: McGraw-Hill Book Co.
— Building Construction Estimating. By: Alonzo Wass. Publisher: Prentice-Hall Inc.
Offered at Ryerson.

13. BUILDING CONSTRUCTION Part III — C163

Prerequisite — Building Construction Parts I and II.
Course Content — Concrete, miscellaneous iron, non-ferrous metals, floor and roof systems and fire proofing, steel, floor finishing, roofing materials, drainage and skylights, plaster, painting, glass and glazing.
Textbook — Materials and Methods of Architectural Construction. By: Parker, Gay & MacGuire. Publisher: John Wiley & Sons Inc.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

14. CONSTRUCTION LAW (Bylaws and Mortgages) — CT103 (Special)

Course Content — Construction laws and bylaws, contracts, engineering agreements, labour laws including industrial relations and trade disputes, Workmen's Compensation, patents and inventions, trade marks, industrial designs and copyrights, company law, boundaries

and surveys, easements, building trades protection, factory and shop acts, mortgages, mechanics' liens.
Textbook — Engineering Law. By: Laidlaw, Young & Dick. Publisher: University of Toronto Press.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

15. CONSTRUCTION ACCOUNTING COSTING, JOB AND OFFICE CONTROL CB125

Course Content — Scope — Construction company management, small, medium and large. Purchasing — sub-contracts, change orders, cost reporting, labour, equipment and materials. Job cost control — problems of job cost control and reporting. Using cost information from previous jobs.
Material Control — Insurance — Bonds — Fire Insurance — Theft Insurance — Underpinning Insurance.
Textbook — Construction Accounting and Financial Management. By: William E. Coombs. Publisher: Mcgraw & Hill Book Company.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

16. QUANTITIES Part III — C166

Course Content — Overheads, plant, hand excavation, machine owning and operating costs, machine production, cost of concrete placing, costs of reinforcing steel, costs of material and labour for forms, concrete floor finishes, estimating the cost of masonry, cost of carpentry and millwork, estimating the cost of structural steel, cost of lath and plaster, cost of roofing and sheet metal.
Textbook — Estimating Construction Costs. By R. L. Peurifoy.
Tuesday — 6.30 p.m. to 9.30 p.m. Ryerson.

17. ARBITRATION, INSPECTIONS & REPORTS — CT107

Course Content — The nature and sources of arbitration, the submission, stay of proceedings, the arbitrator, the preparation and conduct of a case for arbitration, evidence, the award and the enforcement and review thereof, costs, mechanics' liens.
Textbook — "Arbitration". By: Russell. Publisher: Stevens, represented by Carswell of Toronto.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ADVANCED TECHNICAL EVENING COURSES 1969-70

●

Educational Programs

In

Technological Subjects

leading to

Provincial Certification

in

Electrical, Electronic, Mechanical

Instrumentation

Metallurgy

GENERAL INFORMATION

Advanced Technical Evening Courses will be offered in the subjects listed on the following pages:
The first term classes begin on September 29, 1969 and end on December 18, 1969. Second term classes begin January 5, 1970 and end on February 27, 1970. Classes will not be held on statutory holidays.
Theory courses will be 60 hours in length consisting of twenty (20) three (3) hour lectures. Technical Science courses will be 60 hours in length consisting of forty (40) hour lectures and twenty (20) hour laboratory sessions.

REGISTRATION

Students should enrol in person on registration evenings. Counselling and personal interviews will be held during registration evenings of September 15, 16 and 17th between the hours of 7:30 p.m. and 9:30 p.m.
Registration at Campus as indicated below each subject.
Campus A — 21 Nassau Street
Campus B — 37 Dartnell Avenue
Campus C — 51 Teraulay Street
The Colleges of Applied Arts and Technology within the Greater Metropolitan Toronto group will be offering the following series of block programs to assist their students to better schedule their extension courses in the advanced technician field. The blocks follow:

Civil

Mathematics I — CT113
Mathematics II — CT114
Technical Drawing (Civil) — CT164
Physics I — CT124
Surveying I — CT177
Mechanics I — CT125
Mechanics of Materials I — CT127

Electrical

Mathematics I — CT113
Mathematics II — CT114
Electrical Fundamentals —CT190
Electronic Fundamentals — CT209
Physics I — CT124
Electrical Equipment — CT191
Electrical Drafting (Basic) — CT197

Electronics

Mathematics I — CT113
Mathematics II — CT114
Electrical Fundamentals — CT190
Electronic Fundamentals — CT209
A.C. Circuits — CT192
Electronic Circuits — CT210
Physics I — CT124

Mechanical

Mathematics I — CT113
Mathematics II — CT114
Mechanics I — CT125
Mechanics and Materials I — CT127
Electrical Fundamentals — CT190
Physics I — CT124

Mechanical Engineering Drawing — CT158
The above courses are for persons who hold a secondary school Graduation Diploma or the equivalent and who wish to begin or continue their education in the various technologies. A minimum of 50% for each subject, with an overall average of 60% is required for the certificate issued by O.A.C.E.T.T.
Optional subjects may be selected but confirmation of the school of your choice is necessary. By adding English I and one more technical subject the student can qualify for the A.T.E.C. grade 1 certificate.

ADVANCED TECHNICAL EVENING CLASS PROGRAM

FOREWARD

The Advanced Technical Evening Class programs, established in 1952, have been revised several times. The main objective of the modifications which appear in this booklet is to increase the flexibility of the program by extending the number and variety of subjects offered to persons, presently employed, who wish to continue their education as part-time students.

1. to meet the requirements for Advanced Technical Evening Class certificates at one or more of the three levels,
2. to meet the requirements of the student who wishes to improve his knowledge in specific subjects even though he does not intend to complete the total requirements for a certificate. For example, an individual may wish to study one or more subjects which will be of immediate value in his present employment or he may wish to study individual subjects leading towards certification at a higher level in certification programs for technicians and technologists administered by associations such as the Association of Professional Engineers of Ontario,
3. to meet the requirements for the certificate awarded after successful completion of a one-year technical program in a college,
4. to meet the admission requirements to the second year (third semester) of a two-year technician program offered as a regular day-school program in a college of applied arts and technology,
5. to meet the admission requirements to the second year (third semester) of a three-year technology program offered as a regular day-school program in a college,
6. to meet the educational requirements for certification by the Association of Professional Engineers of Ontario as an engineering technician,
7. to meet the admission requirements to the third year (fifth semester) of a three-year technology program offered as a regular day-school program in a college,
8. to meet the requirements for a two-year technician diploma of the regular day-school program in a college,
9. to meet the educational requirements for certification by the A.P.E.O. as a senior engineering technician,
10. to meet the requirements for a three-year technology diploma of the regular day-school program in a college,
11. to meet the educational requirements for certification by the A.P.E.O. as an engineering technologist,
12. to permit a graduate of a two-year engineering technician program of a college or of a former INSTITUTE OF TRADES or Ontario vocational centre to meet the educational requirements for certification by the A.P.E.O. as an engineering technologist after completing further subjects at an appropriate level.

REQUIREMENTS FOR ADMISSION

Grade 1 Certificate

The minimum entrance requirement is the Ontario Secondary School Graduation Diploma obtained after successful completion of any Grade 12 (Ontario) course, provided that the applicant has passed the mathematics and science subjects of grades 11 and 12, or has the equivalent standing from other provinces or countries.
Applicants over 19 years of age may be admitted provided that they have passed English, mathematics, and the science subjects of grades 11 and 12.
(a) in the Ontario secondary school program, or
(b) in the Ontario Manpower Retraining program, or
(c) in an upgrading program offered in a college of applied arts and technology, or
(d) provided that they can submit evidence satisfactory to the college that they are potentially capable of benefiting from the instruction.

Grade 2 Certificate

Successful completion of the requirements for the grade 1 certificate or an equivalent qualification.

Grade 3 Certificate

Successful completion of the requirements for the grade 2 certificate or an equivalent qualification.

REQUIREMENTS FOR CERTIFICATES

Grade 1 Certificate (nine subjects)

A grade 1 certificate will be awarded to a student who completes successfully English I, mathematics I, physics I or mechanics I and six other subjects except English II.
Note:

1. Both physics I and mathematics 1 may be taken as two of the required nine subjects.
2. A student who completes successfully the requirements for a grade 1 O.A.C.E.T.T. certificate in subjects specified by a college may be awarded the appropriate certificate of the college.
3. A student who completes successfully a grade 1 O.A.C.E.T.T. certificate program in subjects specified by the college may be admitted directly to the second year of a cognate technician program offered by the college.

4. A student who completes successfully English I, mathematics I, mathematics II, physics I, mechanics I, general chemistry, electrical fundamentals, electronic fundamentals and technical drawing or a similar grade 1 certificate program specified by the college may be admitted directly to the second year of a cognate engineering technology program in a college of applied arts and technology.
5. Mathematics I and physics I or mechanics I plus five technical subjects at any level are accepted as the educational requirement for certification as an engineering technician by the O.A.C.E.T.T. Normally four of the five technical subjects should be related to the area of specialization, Mathematics II may be used as one of the technical subjects. Proposed deviations from the above requirements should be cleared with the O.A.C.E.T.T.

Grade 2 Certificate

A grade 2 certificate will be awarded to a student who completes successfully English II, mathematics II and four other subjects selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels" shown on the following pages.

Note:

1. A student who completes successfully the requirements for a grade 2 O.A.C.E.T.T. certificate in subjects specified by a college of applied arts and technology may be admitted directly into the third year of a cognate technology program offered by the college. For this option the student must have completed successfully mathematics III.
2. A student who completes successfully the requirements for a grade 2 certificate in subjects specified by a college of applied arts and technology may be awarded the appropriate technician diploma of the college.
3. A student who completes successfully seven subjects, including English I and mathematics II, in addition to the seven subjects referred to in note 5, page 4 will meet the educational requirements for certification as a senior engineering technician with the O.A.C.E.T.T. provided that at least six of the total of fourteen subjects are selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels" shown on the following pages. Normally five of the six subjects should be related to the area of specialization. Proposed deviations from the above requirements should be cleared with the O.A.C.E.T.T.

Grade 3 Certificate

A grade 3 certificate will be awarded to a student who completes successfully mathematics III and any five additional subjects selected from those appearing under the heading "Subjects at the grade 2 and grade 3 certificate levels".

Note:

1. A student who completes successfully the requirements for a grade 3 certificate in subjects specified by a college of applied arts and technology may be awarded the appropriate technology diploma of the college.
2. A student who wishes to meet the educational requirements for certification as an engineering technologist, may do so by selecting appropriate subjects at each of the three certificate levels of the O.A.C.E.T.T. program. The educational requirements for certification as an engineering technologist as published by the O.A.C.E.T.T. are included in the appendix. Students are advised to study these requirements carefully and to clear any deviations in their proposed programs with the O.A.C.E.T.T.
3. A student who is a member of O.A.C.E.T.T. and who proposes to use the technical report written for English II as the report for certification should submit, for approval, the topic and a one-page synopsis to the Registrar, O.A.C.E.T.T., 245 Davenport Road, Toronto 5, Ontario. After the report has been assessed by the instructor it should be submitted to the Registrar for approval of the technical content. The report must show a technical and mathematical depth of understanding of the selected topic. It is suggested that the instructor in English II should submit the topics and synopses, in one mailing, for all students who are members of O.A.C.E.T.T.
4. A graduate of an approved two-year engineering technician program offered in a college of applied arts and technology will meet the educational requirements for certification as a senior engineering technician by the O.A.C.E.T.T. graduate wishing to complete the educational requirements for certification as an engineering technologist should write to the Association for details of the additional O.A.C.E.T.T. subjects which he will be required to complete.

Subjects at the grade 1 certificate level

SUBJECTS (Alphabetically)	RECOMMENDED PREREQUISITES (or the permission of the course director)
Air Conditioning I	
Architectural Drafting I	
Building Construction I	
Cartography I	
Construction Methods and Materials I	
Descriptive Geometry	Technical Drawing I
D.C. Machines	Electrical Fundamentals
Electrical Drafting	
Electronic Fundamentals	Mathematics I
Electrical Fundamentals	Electrical Fundamentals
Electronic Fundamentals (Transistors) I	
English I	
Foundry Technology I	
General Chemistry	

Geology I	
Industrial Hydraulics	
Instrumentation I	
Legal Surveying	
Mathematics I	
Mechanical Installations I	
Mechanics I	Mathematics I
Minerology I	
Physics I	Mathematics I
Quantity Surveying I	Construction Methods and Materials
Refrigeration I	
Survey Computations and Drafting	
Surveying I	Survey Computations and Drafting Mathematics I
Technical Drawing I	
Welding Technology I	
Workshop Technology I	

Subjects at the grade 2 and grade 3 certificate levels

SUBJECTS	RECOMMENDED PREREQUISITES (or the permission of the course director)
Business Law	
English II (Report)	English I
Mathematics II	Mathematics I
Mathematics III	Mathematics II
Mathematics IV	Mathematics III
(a) Advanced Calculus	Mathematics III
(b) Numerical Methods and Digital Computations	Mathematics III
(c) Statistics I	Mathematics II
Economics	
Industrial Management	
A.C. Circuits	Electrical Fundamentals Mathematics II
Computer Control	Electronic Fundamentals Mathematics IV
Electrical Control Systems I	A.C. Circuits Electrical Equipment
Electrical Control Systems II	Electrical Control Systems I Mathematics IV
Electrical Equipment	A.C. Circuits
Electrical Measurements	A.C. Circuits
Electronic Circuits	Electronic Fundamentals
Electronic Fundamentals (Transistors) I	
Industrial Electronics	Electronic Fundamentals Electronic Circuits
Power Systems	A.C. Circuits Electrical Equipment
Boolean Algebra and Digital Computers	Mathematics III
Communications	Electronic Circuits and Mathematics IV
Communications Systems	Communications Networks Pulse Circuits
Computer Technology	Boolean Algebra and Digital Computers Pulse Circuits
Electronic Circuits	Electronic Fundamentals and A.C. Circuits
Electronic Instrumentation	Pulse Circuits
Electronic Systems	Pulse Circuits
Feedback Control Systems	Computer Technology
Pulse Circuits	Electronic Circuits Mathematics IV
Solid State and Component Technology	Physics I Electrical Fundamentals
Data Processing	Introduction to Computers Numerical Analysis
Electrical Systems	Electrical Fundamentals
Industrial Organization	
Industrial Psychology	
Industrial Relations	
Introduction to Computers	Mathematics I
Machine Design	Mechanics of Materials I Mechanics II Technical Drawing
Management Accounting	Mathematics
Statistics II	Statistics I
Mechanics II	Mechanics I Mathematics III
Metrology	Mathematics I Technical Drawing

Operations Research	Statistics I Mathematics III
Plant Layout and Materials Handling	
Production Control	Mathematics I
Quality Control	Statistics I
Systems and Procedures	
Tool Design I	Mechanics of Materials I
Value Engineering	
Wage and Salary Administration	
Work Study	Mathematics I
Foundry Technology II	Foundry Technology I
Mechanics of Fluids	Mechanics II
Mechanics of Materials I	Mechanics I Mathematics II
Mechanics of Materials II	Mechanics of Materials I Mathematics III
Metallurgy	General Chemistry
Theory of Machines	Mechanics II
Thermodynamics	Physics I Mathematics III
Workshop Technology II	Workshop Technology I Mathematics III
Mechanics of Fluids (Civil Technology)	Mechanics II
Soil Mechanics and Foundations	Mechanics of Materials II
Construction Materials	Mechanics of Materials I
Theory of Simple Structures	Mechanics of Materials II
Technical Drawing (Civil)	
Structural Design in Reinforced Concrete	Mechanics of Materials II
Structural Design in Steel	Mechanics of Materials II
Structural Design in Timber	Mechanics of Materials II
Sanitary Technology	Mechanics of Fluids
Highway Technology	Surveying and Mathematics II
Photogrammetry and Air Photo Interpretation	Surveying and Mathematics II
Welding Technology (Civil)	
Surveying II	Surveying I Mathematics II
Refrigeration II	Refrigeration I
Air Conditioning II	Air Conditioning I
Technical Drawing II	Technical Drawing I
Quantity Surveying II	Quantity Surveying I
Mechanical Installations II	Mechanical Installations I
Tool Design II	Tool Design I
Building Construction II	Building Construction I
Survey Computations and Drafting II	Survey Computations and Drafting I
Construction Methods and Materials II	Construction Methods and Materials I
Instrumentation II	Instrumentation I Mathematics I Physics I
Instrumentation III	Instrumentation II
Cartography II	Cartography I
Legal Surveying	
Architectural Drafting II	Architectural Drafting I
Geology II	Geology I Physics I
Minerology II	Minerology I Physics I

Subjects may be added to the above list as the need arises.

SYLLABUS FOR CHEMICAL ENGINEERING TECHNOLOGY

The Committee on Certification of Chemical Technicians sponsored by the Chemical Institute of Canada has accepted the Advanced Technical Evening Class program in Chemical Technology as meeting the educational requirements for certifying Chemical Technicians and Technologists.

The certification is as follows:
Grade I A.T.E.C. certificate — Assistant Chemical Technician
Grade II A.T.E.C. certificate — Chemical Technician
Grade III A.T.E.C. certificate — Chemical Technologist

SUBJECTS	RECOMMENDED PREREQUISITES (or the permission of the course director)
English I	
Mathematics I	
Mathematics II	Mathematics I
Physics I	Mathematics I
Electrical Fundamentals	Mathematics I
General Chemistry	
Organic Chemistry I	General Chemistry
Inorganic Chemistry I	General Chemistry

Physical Chemistry I	General Chemistry and Mathematics I
Electronic Fundamentals	
English II (Technical Report)	English I
Mathematics III	Mathematics II
Mathematics IV (one of the following)	
(a) Advanced Calculus or	Mathematics III
(b) Numerical Methods and Digital Computation or	Mathematics III Mathematics II
(c) Statistics I	Physics I and Mathematics II
Chemical Physics	Organic Chemistry I
Organic Chemistry Laboratory	Physical Chemistry and Mathematics IV
Physical Chemistry II	Physical Chemistry I, Electrical Fundamentals, and Mathematics IV
Physical and Instrumental Methods Laboratory	Inorganic Chemistry, Physical Chemistry I, Organic Chemistry I, and Mathematics III
Quantitative Inorganic Analysis Laboratory	Inorganic Chemistry and Physical Chemistry II
Chemical Engineering Principles	Inorganic Chemistry, Organic Chemistry I, and Physical Chemistry II
Industrial Chemical Processes	Organic Chemistry Laboratory, Inorganic Chemistry, and Matbematics III
Organic Chemistry II	

GENERAL INFORMATION

CREDITS

1. Credits toward a certificate, based on previous qualifications, may be established by the college. These credits do not become effective until the student completes the requirements for a certificate.
2. An applicant for credit must supply adequate proof that he has completed satisfactorily a study of the subject or subjects for which he expects credit.
3. A maximum of six credits only may be allowed toward the grade 1 certificate, and four only for each of the grade 2 and grade 3 certificates.
4. Credits in subjects that have been deleted in this booklet will be honoured in determining eligibility for A.T.E.C. certificates.
5. The following credits may be allowed on presentation of proof of standing in the grades 11, 12 or 13 subjects shown in the following list:
   English I: Grade 13 English Composition
   Mathematics I: Grade 13 Algebra, Trigonometry and Statics
   Mathematics II: Grade 13 Algebra, Trigonometry and Statics and Geometry
   Physics I: Grade 13 Physics, or Grades 11 and 12 Industrial Physics as the technical subject
   General Chemistry: Grade 13 Chemistry, or Grades 11 and 12 Industrial Chemistry as the technical subject
   Electrical Fundamentals: Grades 11 and 12 Electricity as the technical subject
   Electronic Fundamentals: Grades 11 and 12 Electronics as the technical subject
   Technical Drawing: Grades 11 and 12 Mechanical Drafting as the technical subject
   Workshop Technology: Grades 11 and 12 Machine Shop as the technical subject.
6. Grade 12 graduates of the five-year program of the Science, Technology and Trades Branch of the secondary school program may be allowed one credit in the technical subject in which they specialized in grades 11 and 12.
7. In special cases such as those listed below, where assessments are difficult, the college
   1. may require the applicant to write a qualifying examination,
      or
   2. may permit the applicant to take another subject for which the subject under assessment is a direct prerequisite. If the student is successful in the advanced subject, he will be granted credits in both the advanced subject and its direct prerequisite. If there is doubt concerning a credit in Mathematics I, for example, a pass in Mathematics 2 would establish credits in both Mathematics 1 and 2.
      Examples of special cases:
      Students who have attended other evening courses of at least 50 hours' duration;
      Students who have completed correspondence courses of at least 100 hours' duration;
      Students who are over 22 years of age and have had at least three years' industrial experience related to the subject in which credit is desired.

STANDARDS

The instructional time for each subject must be at least 50 hours exclusive of final examinations. Regular tests and examinations are a part of the course in each subject. The passing grades should be comparable to those established by the college for the regular day school programs. With the approval of the course director, any book used in a similar day school subject may be used as the text book in the subject.
Course outlines have been prepared for the subjects listed in this booklet. It is suggested that these outlines be interpreted by the instructor to suit the special requirements of particular classes.

PREREQUISITES

It is the responsibility of the director to ascertain that a student has completed the necessary prerequisites before admitting him to classes in any subject of the course.

ASSIGNMENTS

During the instructional periods, the instructor should plan to use one-third to one-half of the time assisting with individual and class problems which arise. The instructor should also assign homework.
The length of time to be spent on this assignment should be approximately equal to that spent in the classroom. These assignments should be corrected and the marks recorded by the instructor.

ADMINISTRATION

The college is responsible for the administration of the program and for keeping permanent records of the students' progress and final results.

CERTIFICATES

When a student completes the requirements for a certificate the college should apply, on the form provided, to the Director, Applied Arts and Technology Branch, Department of Education, for the appropriate certificate.
If a student completes an A.T.E.C. program, evaluated by the college, as equivalent to its regular day-school program, it is recommended that the college award its regular day school diploma.

ENGLISH I — CT100 (Eng. 100)

The purpose of the course is to assist the student to express himself in simple, clear, correct English.
Oral and written communication. The development of clear, concise, well organized communication with specific application to technical writing and oral presentations. Contemporary ideas — a study of modern literature and current issues.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ENGLISH II — CT101 (Eng. 200)

Prerequisite — English I
The aim of the course is to enable the student to use the English language with greater skill, facility and precision. The preparation of formal talks and lectures on technical subjects. The philosophy of good writing. Technical research, study of basic library resources used in research. The technical report, organization and format, assigned reading.
Wednesday — 7.00 p.m. to 10.00 p.m. Campus T.

ECONOMICS — CT102 (EC 100)

Introduction; Basic economic problems, supply and demand; business units; personal finances; money and banking; labour, international trade; business cycles and national accounts; social services.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

CONSTRUCTION LAW (Engineering Law) — CT103 (Special)

Course Content — Construction Contracts, Engineering Agreements, Labour Laws, including industrial relations and trade disputes, Workmen's Compensation, patents and inventions, trade marks, industrial designs and copyrights, company law, boundaries and surveys, easements, building trades protection, factory and shop Acts, mortgages, mechanics' liens.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

BUSINESS LAW — CT104 (BL 114)

A summary of our laws of contract, employment, agency, sales of goods, Insurance, bailments, real estate, negotiable instruments, partnerships, Corporation, bankruptcy, trade marks, business crimes and torts.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

INDUSTRIAL PSYCHOLOGY — CT105 (PSY 201)

The aim of this course is to help students understand human behaviour. The following topics will be studied and discussed; learning theory, motivation, emotion, perception, personality theory; psychological measurement.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

INDUSTRIAL RELATIONS — CT106 (Special)

A brief history of labour unions in Britain and North America; an examination of labours philosophies; a description of structure and labour organizations; a review of current problems of unions; exploration of the relationships between labour and politics, labour legislation in Ontario; the structure of the Canadian labour market, income theory; and human relations in industry.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ARBITRATION — CT107 (Special)

Course Content — The nature and sources of arbitration, the submission stay of proceedings, the arbitrator, the preparation and conduct of a case for arbitration, evidence, the award, enforcement and review of award, costs, mechanics' liens.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PRE-ADVANCED TECHNICAL MATHEMATICS — CT112 (MATH 130) (C101)

Review of Grade 11 and 12 mathematics to include arithmetic fundamentals, mensuration of areas and solids of various sizes and shapes with practical examples; algebra — index laws, equation of first degree and second degree, factoring, powers of quadratics, logarithms, surds; slide rule, geometric constructions, the right angle triangle, Pythagorean Theorem, geometric proof for the common theorems involving lines, triangles, circles, arcs, and segments; trigonometry — the right-angled triangle, reciprocal ratios, complementary ratios; basic trigonometry formulae to include derivation and practical application.
Wednesday — 7:30 p.m. to 10.00 p.m. 60 hrs. Campus N.

MATHEMATICS I — CT113 (MATH 100)

Prerequisite — Grade 12 Mathematics or equivalent.
Computations with measured quantities: exact and approximate numbers, scientific notation, analysis of error, slide rule and tables.
Algebra: Linear functions, systems of linear functions, determinants, quadratic functions.
Logarithms: logarithmic and exponential functions, applications.
Trigonometry: trigometric functions, application to mechanical and electrical problems.
Series and progressions.
Analytical Trigonometry: complex numbers, vector algebra.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS II — CT114 (MATH 200 I)
Prerequisite — Mathematics I or equivalent.
Binomial theorem.
Notational Systems.
Analytic Geometry: the straight line, loci, conics, general second degree equations.
Differential Calculus: limits, the derivative slope, rate of change, maxima and minima of functions.
Graphical Analysis.
Integration: anti-differentiation, tbe indefinite integral, the definite integral, interpretation of the definite integral.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS III — CT115 (M 200 II)
Prerequisite — Mathematics 2 or equivalent.
Differential calculus — functional notation, gradients, limiting value, differentiation from first principles; maxima and minima; differentiation of products and quotients, of trigonometric functions, with applications to angular velocity and acceleration, simple harmonic motion, and electrical problems. Integral calculus — relationship between differentiation and integration; the definite integral areas; volumes by integration; integration by trigonometric functions; centre of gravity and centroids with applicatios; application of calculus to problems encountered in industry and in related subjects.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MATHEMATICS IV — CT116 (Special)
Prerequisite — Mathematics III or equivalent.
Differentiation of exponential and logarithmic functions — Application to engineering problems.
Moments of inertion, radius of gyration; second moment of area.
The rod, rectangle, disc and cylinder.
Parallel axis theory; perpendicular axis theory.
Review centre of gravity and centroids: Theorems of Pappers.
Standard methods of integration, such as substitution, trigonometric identities, partial fractions and parts.
Radius of curvature; lengths of curves.
Expansion in series; Mac Laurin's Theorem.
Differential Equations — Simple differentiation equations of the first and second order.
Complex Numbers — This subject should be included as required for those students specializing in Electrical or Electronic Technology.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

NUMERICAL METHODS AND DIGITAL COMPUTATIONS — CT117 (Special)
Prerequisite — Mathematics III.
Course Content — Computer organization; flow charting; the Fortran language; constants variables and expressions, input; arithmetic statement; output; control statements; logical statements; subscripted variables; functions; writing, punching and running a program; rounding and truncation errors; roots of equations; simultaneous linear equations; interpolation; numerical differentiation and integration; Taylor's series; curve fittings.
Texts — to be announced.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 brs. Campus T.

STATISTICS I — CT118 (Special)
Prerequisite — Mathematics II
Broadly speaking statistics can be divided into two main types: descriptive statistics, meaning tabular or graphical presentation of data as a source of information, and inductive statistics, the object of which is to make generalizations or predictions by calculation from numerical data. It is inductive statistics with which this course should be mainly concerned, but for interest, descriptive statistics should be considered briefly.
Course Content — The major topics of the course are: Introduction — descriptive and inductive statistics, terms and definitions, sigma notation. Frequency distributions. Measures of location and dispersion. Probability concepts. Theoretical distributions, binomial, normal and Poisson. Sampling distributions. Control charts for means, range, attributes proportions and percent defectives. Problems of estimation.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

STATISTICS II — CT119
Prerequisite — Statistics I.
Course Content — will be published in 1970-1971 calendar.

BOOLEAN ALGEBRA AND DIGITAL COMPUTERS — CT120
Prerequisite — Mathematics II.
Course Content — Numbering systems, basic principles of Boolean algebra, basic operations, basic theorems and truth tables, advanced theorems, minimization techniques, circuit analysis and design by Boolean techniques.
General description, classification and organization of computers, input and output forms and devices, memories, types and properties, the arithmetic unit, steps in "solving a problem"

with a computer, a Fortran program, constants, variables and expressions, mathematical functions, arithmetic statements, input and output, transfer of control, GOTO and IF, writing, punching and running a program.
Case studies introducing basic numerical methods relevant to digital computations.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PHYSICS I — CT124 (PHYS 100)
Prerequisite — Mathematics I or equivalent.
Properties of matter, mechanics — force, motion, speed, velocity, acceleration, projectiles, momentum, simple machines, work, friction, elasticity; heat — temperature measurements, heat transfer, expansion, heat units, latent and super heat, working of sound waves; light — intensity, inverse square law, speed of light; ray optics; wave optics, including lenses, interference, diffraction and polarization.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MECHANICS I — CT125 (MECH 100)
Prerequisite — Mathematics I or equivalent prior to or concurrent with Mechanics I.
Statics — Basic principles of statics; coplanar parallel and concurrent force systems; friction; centroids and centres of gravity; second moments of areas. Dynamics — basic principles, rectilinear motion work, energy and power; impulse, momentum, impact.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MECHANICS II — CT126 (MECH 200)
Prerequisite — Mechanics I and Mathematics III.
Statics — Review of force systems — coplanar non-coplanar parallel, non-copalar concurrent, non-coplanar non-curret force systems; friction. Dynamics — relative velocity; torque, angular motion and energy; motion in a circular path; simple harmonic motion; pressure of liquids; flow of water.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MECHANICS OF MATERIALS I — CT127 (MECH 110)
Prerequisite — Mathematics II and Mechanics I.
Mechanical properties and testing; unit stress and strain; beam type members — statically determinate; beam type member design; deflection due to bending; thin cylinders and joints; resilience; torsion; combined stresses.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MECHANICS OF MATERIALS II — CT128 (MECH 210)
Prerequisites — Mechanics or Material I & Mathematics III.
Course Content — Fatigue and stress concentration, statically determinate members, statically indeterminate members, properties of materials, columns, combined stresses, thick walled and compound cylinders.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MODERN PHYSICS — CT129 (PHYS 200)
Prerequisites — Mathematics III and Physics I.
Course Content — Electro Magnetism: Electrostatics, Electromagnetics, Changed Particle Ballistics, Electromagnetic Waves and Spectrum.
Atomic Physics — Periodic Table (Physical point of view), Emission and Absorption of Radiant Energy, Early structure of an atom, Quantum Theory, Waves or Particles, Bohr Atom and Line Spectra, Modern Atomic Model and Schroedinger Wave Equation.
Physics of the Solid State — Crystaline Solids, Experimental methods of Determining Crystal Structure, Classification by structure, Classification binding Energy Displayed, Electronic Structure of Solids.
Structure and Behaviour of Metals.
Structure and Behaviour of Semi conductors.
Semiconductor Devices.
Nuclear Physics.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

MECHANICAL ENGINEERING DRAWING — CT158 (DR 101)
This course gives the fundamentals of drafting for a wide range of industrial requirements. It serves as an introduction to the specialized courses offered by the College where entry requirements are not met by other qualifications.
Course Content — Fundamental drawing practice, pictorial drawing, engineering fasteners, drawing standards, tolerances, welded joints & symbols, structural shapes, piping symbols, detail & assembly drawings, introduction to gears, materials.
Text — Technical Drawing by Gieseke, Mitchell and Spenser.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

TECHNICAL DRAWING I — CT164 (DR 100)
An introduction to drawing — office practice. It includes basic instruction about instruments, lettering lines, applied geometry, third-angle orthographic projection, isometric projec-

tions, freehand sketching, conventions, sections, dimensioning tolerances, simple working drawings, fasteners, gearing, transmission units, pipe fittings and layouts, electrical drawing of simple and the more intricate circuitry, electrical symbols.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

DESCRIPTIVE GEOMETRY — CT165 (DR 120)
Prerequisite — Technical Drawing I or equivalent.
Problems of engineering design in the general areas of mechanical engineering, civil engineering, and architecture may often be quickly solved by use of orthographic projection. Descriptive geometry is really very advanced orthographic projection, and enables the student to visualize a problem where more than the traditional three views is involved. Visualization based upon logical conclusions which have been derived from observation and analysis, is a principal aim of this course. The application of descriptive geometry principles to practical problems is the final objective. The course will include multiview engineering drawings, space relationships, auxiliary views, points and lines, true length of oblique lines, parallel lines, intersecting lines, perpendicular lines, true size of oblique plane surfaces, edge views, slope of a plane, intersection of a line and a plane, location of a figure on a plane surface, dihedral angles, revolution methods to find the true length of lines and the true shape of surfaces, counter-revolution, single curved surfaces, intersection of two plane surfaces, intersections involving planes, cones, and cylinders.
Text — Technical Descriptive Geometry by Wellman.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

TECHNICAL DRAWING II — CT166 (Special)
Prerequisite — Technical Drawing I or equivalent.
This course is a continuation of Technical Drawing I. The individual topics are treated in greater depth. Bearings, types, materials, lubrication, selection from manufacturers' catalogues. Cam design, motion diagrams, types of motion, cam layouts, types of followers, detail drawing and applications. The use of catalogues for selecting fasteners, fittings, springs and other standard components. Production dimensioning techniques, unilateral and bilateral tolerances, concentricity, machine fits, dimensioning problems. Engineering materials, ferrous and non-ferrous metals, plastics, rubber, fibre, production methods, relative costs. Gages and gage design, basic principles, snap, ring, length, and plug types. Industrial drawing applications, design and layout drawings, detail drawings, sub-assemblies and assembly drawings.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

POLYMER CHEMISTRY — CT167 (CHEM. 210)
Prerequisite — Grade XIII.
Course Content — The chemistry and physics of natural and synthetic polymers covering the following topics: molecular forces and chemical bonding, molecular weight and its distribution, configurations and conformations of polymar chains, morphology, condensation and addition polymers, copolymers, methods for determining molecular weight of polymers, structure of polymer molecules, how structure determines properties of polymers, testing and degradation of polymers: rheology of polymers. Emphasis will be placed on common plastic materials.
Practical work in the laboratory.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

GENERAL CHEMISTRY — CT168 (CHEM 100)
METHODS OF CHEMISTRY: physical and chemical changes, chemical terminology.
ORGANIC CHEMISTRY: structure and reactions of common aliphatic groups.
STATES OF MATTER: gas laws, partial pressure.
NUCLEAR CHEMISTRY: basic nuclear particles, isotopes, radioactivity, half life, radio-isotopes and uses.
EQUILIBRIUM: rate of reaction, reversibility, Le Chatelier's Principle, equilibrium constants, solubility as an equilibrium process, methods of expressing solubility and concentration, ion exchange.
ACIDIMETRY AND HYDROLYSIS: definitions, pH, indicators, titra; ions, relation to oxidation and reduction.
ELECTROCHEMISTRY: electrolysis, Faradays Law, electro-chemical series, corrosion.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

BLUEPRINT READING FOR MACHINE TRADES — CT170 (DR 130)
The aim of this course is to provide tradesmen with a basic understanding of blueprint reading.
Freehand Sketching: Freehand sketching of simple and complex objects using multiview, isometric and oblique projections.
Blueprint Reading: Study of methods of representation of objects including orthographic multiview, isometric and oblique projection. Dimensions and tolerances, notes and specifications, surface finish. Auxiliary views, sections. Threads and fasteners. Gears and cams, simple developments. Detail and assembly drawings. Methods of reproduction of drawings.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

TOOL DESIGN I — CT173 (MECH 201)
Prerequisite — Technical Drawing, Mechanics of Materials.
Tolerances and allowances. Common tool construction steels. Tool drafting and dimensioning. Jig and fixture components. Design procedure and analysis — Design assignments.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

QUALITY CONTROL — CT174 (Special)
Organization of the quality control department; measuring the results of such a department and the effectiveness of its personnel. Auditing the quality control function; cost of quality. The philosophy of total quality control. In-process quality control. Customer complaint reporting, analysis and evaluation. Relationships between reliability studies and quality control. Use of probability papers. The philosophy of designed experiments. Evolutionary operations.
Text — Quality Control — Theory and Applications. By: Bertrand L. Hanson — Prentice Hall.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

SOIL MECHANICS AND FOUNDATIONS — CT175 (Co 100)
Prerequisites — Mechanics of Materials II.
Course Content — Classification of soils, weight-volume relations, compaction of soils, permeability, the principle of effective stress, shearing strength of Cohesionless soils, shearing strength of clayey soils, Origin of soils, soil exploration, spread botings — bearing capacity, consolidation, pile foundations, caissons, stability of slopes, lateral earth pressures.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

CONSTRUCTION MATERIALS — CT176 (Co 103A)
Prerequisite — Soil Mechanics and Foundations.
Course Content — Specifications and contracts related to construction, aggregates, cement, elements of quality concrete, ACT method of concrete mix design, special concretes and concrete admixtures. Manufacture and effective utilization of concrete, field problems, soil cement stabilization, introduction to asphalts, bituminous pavements, asphalt mixtures, aggregates for Asphalt Concrete, Asphalt concrete mix design; production, construction, field control of asphalt.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

SURVEYING — CT177 (SURV 100A)
Prerequisite — Mathematics I.
Course Content — Importance of surveying, correction for measured distances, use of simple distance measuring equipment.
Measurements of angles — with transit; Differential trigonometric, profile and cross-section levelling, Type, adjustments and use of levels — problems.
Methods of stadia — problems; Topographical surveys contour lines; Direction of line, magnetic Meridian and declination, isogonic chart, asimuth and bearing of a line — traverse surveys and computations, closing a traverse by latitudes and depatudes, Traverse computations, error of closure, coordinates, area by double meridian distance — problems, preparations of topographic map — construction surveys, municipal surveys, grades, methods of setting grades — horizontal circular curves, theory, computations, field practise — demonstration of modern survey equipment.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRICAL FUNDAMENTALS — CT190
Prerequisite — Mathematics I.
Basic electrical concepts; simple D.C. circuits; power; magnetism, electromagnetism; magnetic circuits; D.C. measuring instruments; A.C. measuring instruments electrical measurements; induction; capacity; alternating current, reactance, impedance, power in A.C. circuits.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL EQUIPMENT — CT191
Prerequisite — Electrical Fundamentals.
Introduction to electrical equipment; construction of direct current motors and generators; direct current generator principles; direct current generator characteristics; direct current motor principles; direct current motor characteristics; parallel operation of generators; synchronous motors; polyphase induction motors; single phase induction motors.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ALTERNATING CURRENT CIRCUITS — CT192 (Special)
Prerequisite — Electrical Fundamentals and Mathematics II.
Inductance; capacitance; alternating current fundamentals; R, L, and C in A.C. circuits; series A.C. circuits; parallel A.C. circuits; series resonance; parallel resonance; vector loci analysis; network theorems; coupled circuits and transformers; polyphase circuits; non-sinusoidal waves.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N. (Subject to student approval this course can be run on Saturday a.m.)

ELECTRICAL MEASUREMENTS — CT193 (Special)

Prerequisites — Electrical Fundamentals.
Course Content — Principles of Measurement, The D'Arsonval Meter Movement, D.C. Ammeters, D.C. Voltmeters, A.C. Voltmeters and Ammeters, Power Measurements. Instrument Transformer Use — The Ohmmeter, Multimeters — Vacuum Tube Voltmeters — Secondary Standards — Precision Measurement of Resistance — Voltage & Current — A.C. Bridge Circuits — Oscilloscopes — Oscilloscope Accessories — Audio frequency and Signal Generators, Magnetic Measurements — transducers — Indicating and Registering Equipment.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL CONTROL SYSTEMS I — CT194 (Special)

Prerequisites — Alternating Current Circuits & Electrical measurements.
Course Content — Outline limitations of Manual control advantages of Magnetic control systems, Relays and Contractors — Magnetic Structure, contact structure, coil requiremnts, Control Accessories — Time delay relays, Switches, Amplifiers.
Basic Relay Circuits — Design of simple control circuit, analysis of control circuits, sequence diagrams.
Direct Current Motor Operation — speed-torque curves, load characteristics, performance curves. (series motors), performance curves for generators, stability, shunt motor operation, compound motors.
Basic Direct Current Control Circuits — line starting, push button start circuits, jogging circuit for line start, reversing, series resistance starting, field acceleration, armature shunting, dynamic braking circuits, plugging circuits alternating current motor control — modes of acceleration, primary resistance starting, primary reactance starting, Star-Delta starting, Autotransformer starting, Synchronous motor starting, Resistor calculations — types of resistor.
Materials, current capacity, application data. Solenoids and Brakes — function, types, determination of size, calculation of deceleration time, typical brake data.
Speed Control — typical requirements, characteristics of speed control system, Rheostatic control of DC shunt motors, Rheostatic control of wound rotor Motors, Multispeed motors.
Speed Control With Auxiliary Power — adjustable Voltage meters, adjustable speed drives for induction motors.
Static Control System — Advantages, Magnetic amplifier control, transistorized units.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL CONTROLS SYSTEMS II — CT195 (Special)

Prerequisite — Electrical Controls System I and Mathematics IV (Advanced Calculus).
Course Content — Fundamentals of servo systems; servo components; meaning of characteristics of systems; analysis of systems using transient and frequency response; root locus; P-plane techniques; the introduction and use of LaPlace Transforms is essential to the above applications.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

POWER SYSTEMS — CT196 (Special)

Prerequisite — A.C. Circuits.
Course Content — Power Transmission and Control, Hydraulic Generating Stations, Thermal Generating Stations, Economics of power systems. Single diagrams, Generating and Transformer Stations, Transmission and Distribtuion systems, Protective Relaying, Power Line Carrier Communications, Metering.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL DRAFTING (Basic) — CT197 (DR 113)

Prerequisite — Grade XII or equivalent.
Course Content — Lettering, use of instruments, linework, orthographic projection, dimensioning, sections, architect scale, isometric projection, sketching.
Electrical and electronic symbols, basic electrical circuit diagrams, transformers, relays, riser and block diagrams, residential wiring, illumination and electric heating.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRICAL DRAFTING (Advanced) — CT198

Prerequisite — Electrical Drafting (Basic).
To be introduced 1970-71.

ELECTRONIC FUNDAMENTALS — CT209 (ELTC 100)

Prerequisite — Electrical Fundamentals and Mathematics II.
Atoms, electrons and current flow; two-element electron devices; three-element electron devices; multigrid tubes; special transistors; auxiliary components in electric circuits. A.C. circuits in electronic decibels and sound, rectifiers; the vacuum-tube amplifiers, the transistor amplifier.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC CIRCUITS — CT210 (Special)

Prerequisite — Electronic Fundamentals.
Course Content — Transformers and Transformer-coupled amplifiers, Resistance-Capacitance Coupled amplifiers, Special amplifiers, push-pull and phase inversion, Class C Amplifiers, Feedback, Feedback Oscillators, Negative — resistance Oscillators, Miscellaneous sine-wave oscillators, Modulation, detection, audio elements.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

PULSE CIRCUITS — CT211 (ELTR (200)

Prerequisites — Electronic Circuits and Mathematics IV.
Course Content — C.R. Wave Shaping Circuits, LR Shaping Circuits Diode Clippers or Limiters, Diode Clampers (D.C. Restorers) Triode Squarer Circuit, Bistable Multivibrator, Schmitt Trigger Circuit, One Shot Multivibrator, Plate Coupled Multivibrator, Cathode Coupled Multivibrator, Thyrothon, Sawtooth Oscillator, Discharge Tube Time Base Circuit; Miller Time Base Circuits, Blocking Oscillator, Binary and Decimal Binary Counter.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC SYSTEMS I — CT212 (ELTR 202)

Prerequisite — Pulse Circuits.
Course Content — A. Monochrome Television Systems. Methods of visual representation, scanning and synchronization, analysis of one frame, synchronization and sweep circuits, cathone — Ray tubes, Television transmission and reception, the Video signal, video-amplifiers — wide band amplifiers, Television cameras.
B. The Oscilloscope.
Input circuits, plate loaded amplifiers, delay lines and distributed amplifiers, time-base generators, horizontal deflection systems, block diagrams.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC FUNDAMENTALS (Transistors) I — CT213

Prerequisite — Thorough knowledge of electronic fundamentals and radio receiver circuitry.
Course Content — Introduction to modern electron theory, semi-conductor physics, junction transistors, transistor characteristisc, transistor amplifiers, transistor oscillators, transistor radio receivers, transistors in television, receivers, transistors in electronic circuits, transistor developments, servicing transistor circuits. Laboratory work will form part of the course.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

INDUSTRIAL ELECTRONICS — CT214 (Special)

Prerequisite — Electronic Circuits.
Course Content — Analysis of electronic circuits of modern controls — special circuit designs incorporating semiconductors, vacuum tubes, electronic sensors, and magnetic devices.
Emphasis should be placed on industrial semiconductor applications. Special applications:— silicon controlled rectifier (SCR) field supplies, ultrasonic circuits, welders, precipitators, and industrial heaters.
Text — to be announced.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

COMPUTER CONTROL — CT215 (Special)

Prerequisite — Electronic Fundamentals and Mathematics IV (Advanced Calculus or Numerical Methods and Digital Computations — both preferred).
Course Content — This course is intended to advance the student through basic static logic circuit elements to a thorough understanding of the operation of digital computers. The application of static logic and computer control to industrial processes should be emphasized. The study of the analogue computer as a system simulator for control system analysis as well as a controlling element.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

COMMUNICATIONS NETWORK — CT216

Prerequisite — Electronic Circuits and Mathematics IV (Advanced Calculus).
Course Content — Radio frequency power amplifiers, modulation, demodulation in A.M. and F.M. systems, transmission line theory, simple antenna arrays, waveguide theory, wave propagation, noise.
Texts — Everitt — Communications Engineering — (McGraw-Hill); F. Terman — Electronic and Radio Engineering — (McGraw-Hill); Ryder — Networks, Lines and Fields — (Prentice-Hall).
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC INSTRUMENTATION (For Electronic Technology) — CT217 (Special)

Prerequisite — Pulse Circuits.
Course Content — Investigation of the principles, applications and limitations of complex electronic instruments, such as: wave analyzers, frequency meters, broad band pulsed sweep oscillators, digital display instruments, recorders and a wide variety of other modern electronic instruments.
Texts — S. Prensky — Electronic Instrumentation — (Prentice-Hall); G. Partridge — Principles of Electronic Instruments — (Prentice-Hall).
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

ELECTRONIC DRAFTING (For Electronic Technicians) — CT218 (DR 116)
Prerequisite — Grade XII or equivalent.
Course Content — Use of instruments, lettering, dimensioning, sketching and orthographic projection. Electronic symbols, use of template and symbol hook up practice. Component outline and block diagrams. Schematic diagrams for tube and transistor circuits, cable drawings and single and double sided printed circuit board layouts. Electro-mechanical design of chassis, panels and terminal boards including materials and finishes. Wiring diagrams and harness assemblies and installation procedures. Graphs and charts.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus T.

TELEMETERING — CT435
Prerequisite — Some electrical or electronic knowledge and experience.
Course Content — Current, voltage, ratio, frequency, impulse and multiplexing systems. Pneumatic and hydraulic methods, pickups, links and channels, selection and application.
Text to be announced.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

FINAL CONTROL ELEMENTS — CT436
Prerequisite — Instrumentation training.
Course Content — Control valve "sizing" and selection. Pneumatic, electrical and hydraulic operators, valve positioners, damper motors, saturable reactors and magnetic amplifiers, servomechanisms. Systems and applications.
Text to be announced.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

AUTOMATIC CONTROL PRINCIPLES I — CT437
Prerequisite — Measuring principles, Electronic Instrumentation or previous Instrumentation training.
Course Content — Fundamental elements of instruments, measuring means, controlling means, concept of a control loop, loops in block and schematic diagrams. Types of controllable response, control modes, controller alignment procedures, dynamic characteristics or a control loop.
Text to be announced.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

COMPUTER CONTROL PRINCIPLES I — CT438
Prerequisite — Mathematics and electronic background.
Course Content — Introduction to the binary concept, principles of digital logic, Boolean algebra, the rules for logical manipulation, digital subsystems, digital systems.
Text to be announced.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

ELECTRONIC INSTRUMENTATION — CT439
Prerequisite — Electronic Fundamentals or previous electronic training.
Course Content — Study of electronic instruments and their applications for the measurement of temperature, pressure, level, flow, viscosity, specific gravity etc. Vacuum-tube and semi-conductor theory, bridges, amplifiers, power supplied, oscillators.
Text to be announced.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

MEASURING PRINCIPLES I — CT440 (formerly Instrumentation I — CT430)
Course Content — C.G.S., M.K.S., F.P.S., systems of units. Dimensional analysis. Theory and construction of devices, mechanical — pneumatic methods for the measurement of pressure, vacuum, temperature, flow, viscosity, specific gravity, level, etc.
Text to be announced.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

WELDING TECHNOLOGY — CT516
This program is designed for people wishing to enhance their knowledge of welding metallurgy and welding processes.
Course Content — Introduction to metal joining and welding metallurgy, fundamentals of metallurgy, metallurgy and welding, mechanical properties of commonly used industrial metals, welding of specific materials including discussions on effects of expansion and contraction, stress control methods, pre-heating, post-heating, tempering, control of hardness, porosity, cracking of parent metal etc., elimination of weld faults.
Wednesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

MACHINE DESIGN CT518 (Special)
Prerequisites — Technical Drawing I — Mechanics of Materials I — Mechanics II.
Course Content — Design philosophies, stress analysis, properties of materials. Dimensional tolerances and surface roughness. Design and types of screw thread fasteners. Shafting, commercial sizes, specifications, designs, keys, couplings. Bearings, journal, anti-friction, selection,

application, seals. Power transmission, spur, helical, bevel and worm gearing. Designs and applications. Belt and pulley drive designs and applications. Centrifugal clutch and brake designs. Springs, types, properties, materials, design and manufacture. Design problems, layouts, detail and assembly drawings.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

METALLURGY — CT530 (Special)
Prerequisites — General Chemistry.
Production of iron and steel — direct reduction processes — alloy constitution diagrams Fe3C system — heat treatment — physical metallurgy — alloy steels — non-ferrous metals — physical testing.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus N.

METROLOGY — CT531 (METR 100)
Prerequisites — Mathematics II and Technical Drawing.
History and principles — basic instrumentation — dial gauges and test indicators — surface plates — Micrometers and verniers — gauge blocks — optical instruments and testing — surface finish — screw thread and gear measurement — angular measurement — fixed gauges — air gauges — autometrology.
Tuesday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

WORKSHOP TECHNOLOGY — CT600 (Special)
Prerequisite — Grade XII.
Review of basic manufacturing processes — Metal cutting — precision measurement and inspection — centre, capstan and turret lathes — horizontal and vertical mills — surface and cylindrical grinders — jig boring, broaching, diesinking, centerless grinding — electro-discharge and electro-chemical machinery numerical control.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

TOOL DESIGN EVENING CLASS PROGRAM
An evening student may study individual courses or he may complete a prescribed program of courses as credits toward a diploma as a Tool Design Technician. Details of the program are shown in the 1969/70 day calendar and in the Tool Design Technician brochure. Some credits may be granted to mature students on the basis of previous education or experience. Enquiries should be made at the Registrar's office, 37 Dartnell Avenue.
For information purposes only, the outlines of Tool Design courses are shown on the following pages. To enable prospective students to plan their own study programs, the following courses will be offered during the sessions shown:

	1969/70	1970/71	1971/72
Jig & Fixture Design I	*		*
Jig & Fixture Design II	*	*	
Jig & Fixture Design III		*	*
Jig & Fixture Design IV			*
Die Design I	*	*	*
Die Design II	*		*
Die Design III		*	*
Die Design — Moulds	*	*	*
Process Engineering		*	

TOOL DESIGN COURSES
Prerequisite — Grade XII, either Machine Shop or Drafting Option or equivalent industrial experience.

JIG & FIXTURE DESIGN I — CT601 (TD100)
Freehand sketching and machine drafting of basic jib and fixture designs, emphasizing current production methods and organization.
Tuesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

JIG & FIXTURE DESIGN II — CT602 (TD101)
Freehand sketching and machine drafting of advanced jig and fixture designs, emphasizing current production methods and organization.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

DIE DESIGN I — CT605 (TD 200)
Freehand sketching and machine drafting of basic blanking, piercing, cut-off and bending dies.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

DIE DESIGN II — CT606 (TD201)
Freehand sketching and machine drafting of advanced blanking, piercing and bending dies. Introduction to basic draw dies.
Tuesday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

DIE DESIGN III — CT607 (TD202)
Freehand sketching and machine drafting of advanced draw dies and complex blank, pierce and bend progressive dies.
Offered in 1970-71.

DIE DESIGN — MOULDS — CT621 (TD203)
Freehand sketching and machine drafting of plastic mould and impact extrusion die designs.
Monday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

PROCESS ENGINEERING — CT622
Company organization, estimating, work study, tool economics, production and quality control.
Offered in 1970-71.

TOOLMAKING COURSES
An evening student can qualify for a diploma as a Toolmaking Technician by studying courses outlined in the 1969/70 day calendar. Alternatively, evening students may enrol in courses to upgrade their toolmaking skills.
All Toolmaking courses are described but they will be offered in the sessions noted below.

	1969/70	1970/71	1971/72
Jigs and Fixtures I	*		*
Jigs and Fixtures II	*	*	
Gauges		*	*
Diemaking	*		*
Special Machine Techniques		*	
Diemaking I	*	*	*
Diemaking II	*		*
Diemaking III		*	
Numerical Control		*	*

JIG & FIXTURES I — CT617 (MACH 120)
Layout procedures, fitting, fastener application, part planning, jig and fixture parts.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.
JIG & FIXTURES II — CT625 (MACH 121)
Milling, welding, grinding and assembly fixtures, drill jigs.
Monday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

GAUGES — CT622 (MACH 122)
Plug and ring gauges, gap gauges and special gauges.
Offered in 1970-71.

DIEMAKING — CT623 (MACH 123)
Die parts and functions, types of press tools, die clearances.
Thursday — 7.00 p.m. to 10.00 p.m. 60 hrs. Campus D.

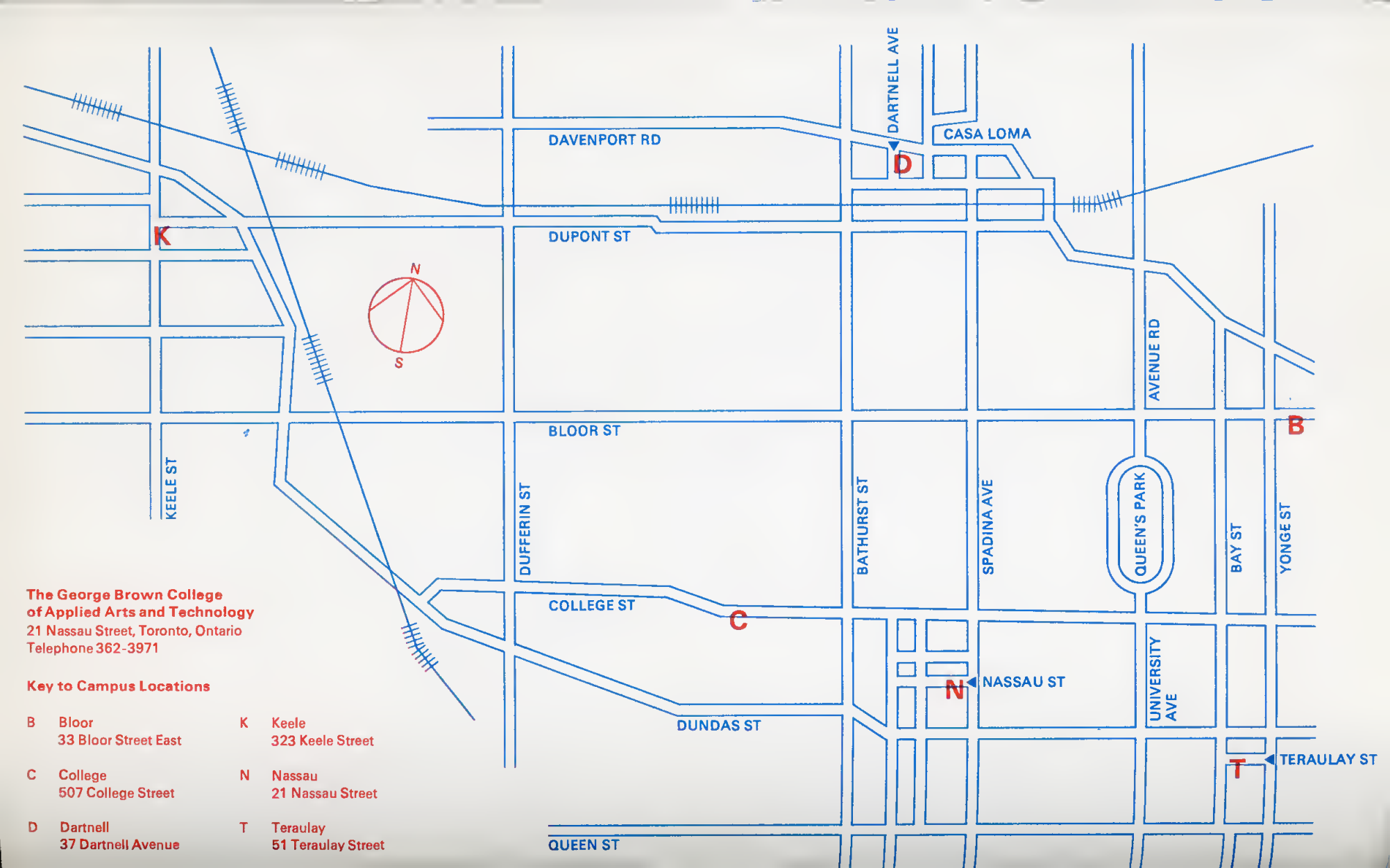
SPECIAL MACHINE TECHNIQUES — (MACH 203)
Engraving, jig boring, jig grinding, slotting, tool and cutter grinding, turret and tracer lathe, electrical discharge machine, three dimensional milling, electro-chemical and ultrasonic machining, high energy forming, spinning.
Offered in 1970-71. 90 hrs.

DIEMAKING I — CT618 (MACH 204)
Punch press theory and operation, press brake theory and operation. Theory, development, construction and operation of the following types of dies: cut-off, trim, pierce, bending, blank, forming, compound.
Thursday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

DIEMAKING II — CT619 (MACH 205)
Theory, development, construction and operation of the following types of dies: progressive, draw, shaving, lancing, coining and embossing.
Monday — 7.00 p.m. to 10.00 p.m. 90 hrs. Campus D.

DIEMAKING III — CT620 (MACH 206)
Theory, development, construction and operation of most of the following dies: cold forming, bulging, swaging, broaching, assembly, sub-press, extruding, curling, side cam, horn, moulds (plastic and die cast) vacuum forming.
Offered in 1970-71. 90 hrs.

NUMERICAL CONTROL — CT626 (MACH 208)
Definitions, history of machine tools, advantages and applications of N.C., axes, absolute and incremental systems, point to point and continuous path systems, programming, tooling tape preparation, binary systems.
Offered in 1970-71.



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Key to Campus Locations

B	Bloor 33 Bloor Street East	K	Keele 323 Keele Street
C	College 507 College Street	N	Nassau 21 Nassau Street
D	Dartnell 37 Dartnell Avenue	T	Teraulay 51 Teraulay Street